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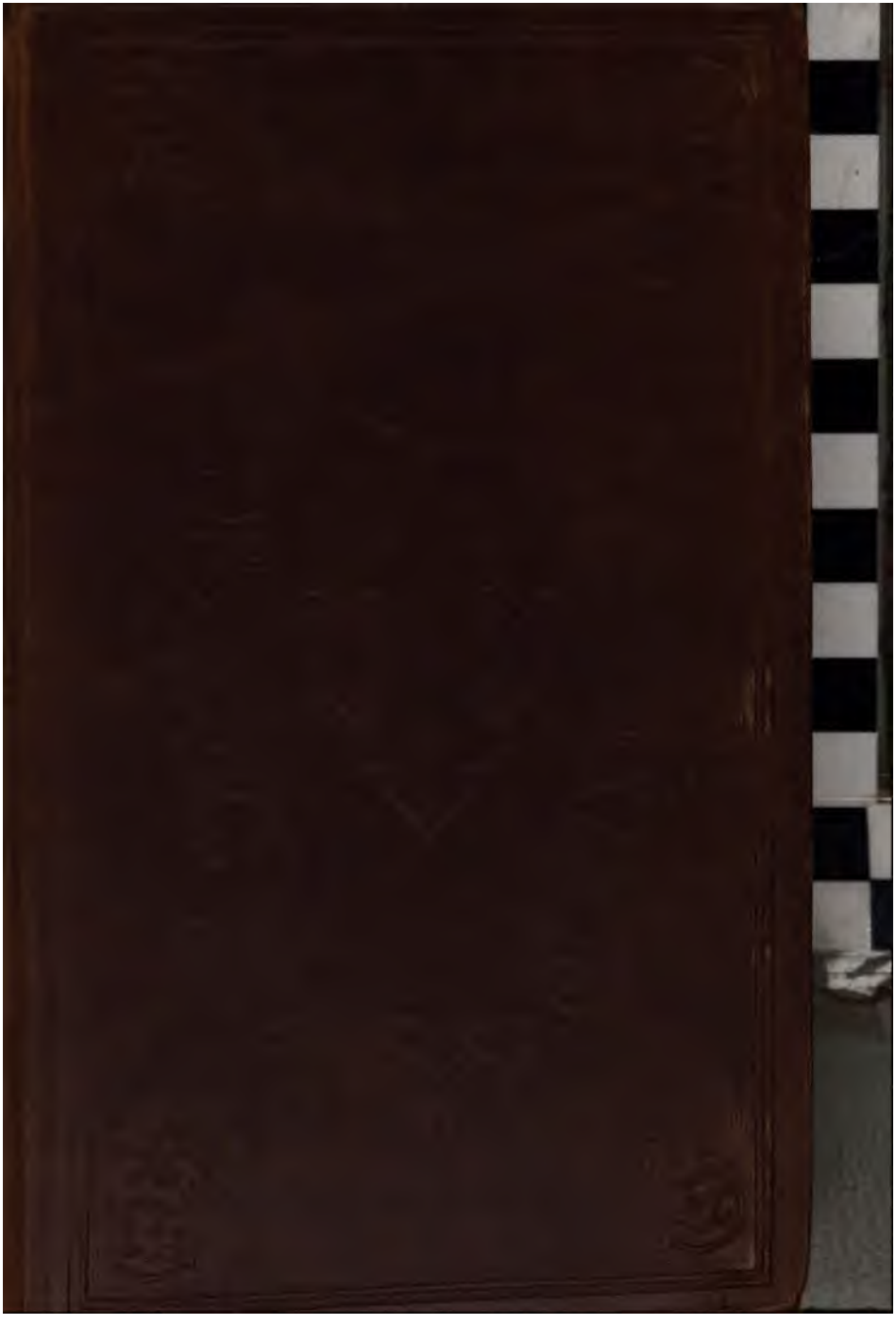

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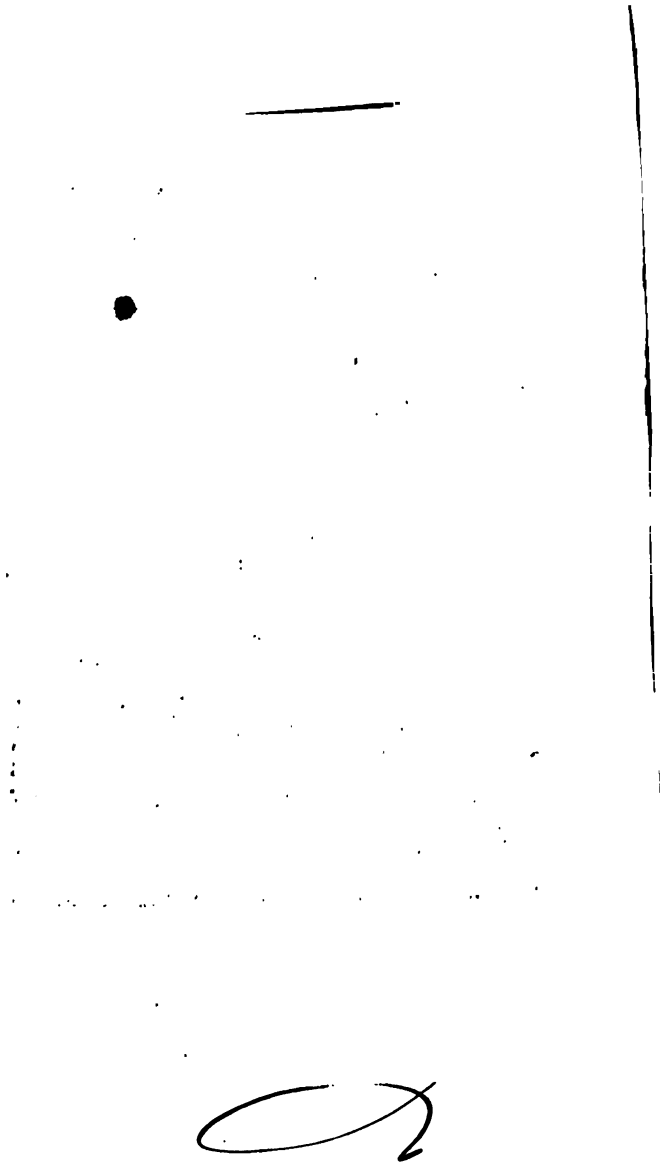

NARRATIVE

OF AN

EXPEDITION

TO

THE POLAR SEA,

IN THE YEARS 1820, 1821, 1822 & 1823.

COMMANDED BY LIEUTENANT

NOW ADMIRAL FERDINAND VON WRANGELL,

OF THE RUSSIAN IMPERIAL NAVY.

SECOND EDITION, WITH ADDITIONS.

EDITED BY

LIEUT.-COL. EDWARD SABINE, R.A. F.R.S.

LONDON:

JAMES MADDEN AND CO.,

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PREFACE

TO THE

SECOND EDITION.

THE narrative of M. von Wrangell's Expedition was drawn up by himself in the Russian language in 1828, and on his departure for the government of the Russian Colonies on the North-west coast of America, it was placed by the Admiralty in the hands of Admiral Golownin, in the contemplation of its publication by the Government. The death of that distinguished officer, and the prolonged absence of M. von Wrangell, probably contributed to the subject being lost sight of by the Russian Admiralty; and at a later period, at the request of Professor Ritter, M. Englehardt undertook to make a German translation of the unpublished manuscript. M. Engelhardt's work appeared in 1839, accompanied by a map com-

municated by M. von Wrangell himself. In the following year, 1840, the first edition of the present volume was published, being a translation made by Mrs. Sabine from the German of M. Engelhardt, reduced into a somewhat smaller compass than the original, partly by the omission of the meteorological tables, partly by the substitution of a more simple and concise style, and partly by the occasional curtailment of repetitions which are not unfrequent in different portions of the original work.* The temperatures occurring in the text have been changed from Réaumur into Fahrenheit's scale. Distances, weights, and prices have been preserved in the original expressions, in wersts, poods, and roubles: and the English reader who may require it, is reminded that the value of the current rouble (which is the rouble here spoken of) is between 10*d.* and 11*d.*, that a pood or 40 Russian lbs., is about 36 lbs. avoirdupois; and that a werst is about two-thirds of a British statute mile, or more exactly, that 104 wersts make 60 geographical miles. The dates are in the "old style," which is still in use in Russia, and twelve days are to be added, to give

* The order of succession of the different parts of the work has been modified in a few instances, both by the German and the English translators, each with a view to what appeared to them the most convenient arrangement to the reader.

the corresponding dates in the style adopted by other European nations; thus New Year's Day in this volume is our 13th of January, and so forth.

Besides having undergone careful revision here, the present edition has gained by the correction by M. von Wrangell himself, of such errata as had found their way into the German, and had not been discovered in the course of the English translation. This edition has besides, not only the advantage of being in a much cheaper and more accessible form than the first, but it has also been enriched by a portrait of Admiral von Wrangell, and by an additional chapter, containing a brief narrative of the proceedings of the Ustiansk expedition, under M. von Anjou, of whose labours the New Siberian Islands, and the sea in their vicinity, were the principal scene. I am indebted to Admiral von Wrangell for the communication of the German manuscript containing these notices, which have not before been published, as well as for the very kind manner in which he has complied with my request—to be furnished with the means of prefixing an engraving of himself to the second edition, by sending me for that purpose a portrait in oils, which is esteemed, I understand, an excellent likeness.

It is with very great satisfaction that I am enabled on the present occasion, to state the full

concurrence of M. von Wrangell in the opinions which I ventured to express in the preface to the first edition, relative to the navigation of the Polar Sea. M. von Wrangell says, in a letter addressed to me :—

"The opinion expressed by you in the preface relatively to the existence of open navigable water in the north, corresponds perfectly to the impressions which were excited in me by the constantly-repeated obstacles to a further advance to the northward over the ice. According to my views it should be possible to reach and to follow this open water from Spitzbergen. If it were possible to embark in a suitably fitted vessel from New Siberia, a most interesting result might probably be expected. There would then seem still to remain a wide field of research open to the spirit of enterprise of experienced navigators, before the question of a water communication between the two oceans in high northern latitudes be decidedly solved."

As I have myself seen no reason to alter or modify the opinions referred to, and as their possible bearing on future researches has still the same importance in my view,—and was in fact a principal motive to the undertaking of the present work,—I subjoin the portion to the preface of the first edition in which those opinions were expressed.

"Whether we view M. von Wrangell's narrative as an authentic account of a portion of the globe and of its inhabitants, hitherto but very imperfectly known;—or as a personal relation of difficulties encountered and privations borne in a spirit which England cherishes in its own officers, and is not slow to value in others;—or finally, as an essential portion of the history of ARCTIC DISCOVERY, in which our own country has taken so prominent a part;—in each, and in all of these respects, it has a claim on the attention and interest of British readers.

"The facts and circumstances made known by an expedition which was engaged during three years in geographical researches, extending over fifty degrees of longitude of the coast of the Polar Sea, must in many instances bear, by a close analogy, on reasonings connected with the yet unexplored portion of the Arctic Circle; and they do so particularly in respect to that part, which has been, and still continues to be, the theatre of British enterprise.

"There is a striking resemblance in the configuration of the northern coasts of the continents of Asia and America, for several hundred miles on either side of Behring Straits; the general direction of the coast is the same in both continents, the latitude is nearly the same, and each

has its attendant group of islands to the north,—the Asiatic continent, those usually known as the New Siberian Islands;—and the American, those called by Sir Edward Parry the North Georgian Group, and since fitly named, from their discoverer, the Parry Islands. The resemblance includes the islands also, both in general character and in latitude.

"With so decided a similarity in the configuration and position of the land and sea, it is reasonable to expect that there should be a corresponding resemblance in the state and circumstances of the ice, by which the navigation of the ocean may be effected.

"In perusing M. von Wrangell's description of that portion of the sea which is comprised between the Asiatic Continent and the New Siberian Islands, those who have had personal experience of the corresponding portion of the sea on the American side, namely, of the portion included between the Continent and the Parry Islands, must at once recognise the close resemblance which the ice described by M. von Wrangell bears to that which fell under their own observation. In both cases, in summer, a narrow strip of open water exists between the shore and the ice, admitting of the occasional passage of a vessel from point to point, subject to frequent interruptions

from the closing of the ice on the land by certain winds, and from difficulties at projecting capes and head-lands. The main body of the ice, by which the sea is covered, is at that season broken into fields and floes of various extent and size, with lanes of open water intermediate; and in this state things remain till the first frosts of autumn, when the whole is cemented into a firm and connected covering, and remains so during the winter. From the circumstance of the Siberian islands being rich in the remains of mammoths, which form a valuable article of commerce, this natural bridge is traversed every year by many persons, who pass and repass in winter and in spring:—on the American side it is trodden only by the rein-deer and musk-oxen, in their spring and autumn migrations.

"The thickness of ice formed in a single season is stated by M. von Wrangell to be about nine and a-half feet; if prevented from drifting away during the summer, a second season will add about five feet; and a third season, doubtless, somewhat more. The fields of ice, which have been met with by the British expeditions in parts of the sea which are known to be cleared in every year,—in Baffin's Bay and Hudson's Straits, for example, and to the north and west of Spitzbergen,—have usually been from nine to ten feet

thick; and I well remember the surprise excited in the expedition which penetrated to Melville Island, at the extraordinary and unprecedented thickness of the field-ice which they encountered, after passing Barrow Strait, and entering, for the first time, the portion of the sea comprised between the continent and the islands to its north; evidencing that on that portion of the sea the icy covering remains for successive years. The general thickness was more than double that of the formation of a single year.

"All the attempts to effect the North-West Passage, since Barrow Strait was first passed in 1819, have consisted in an endeavour to force a vessel, by one route or by another, through this land-locked and ice-encumbered portion of the Polar Ocean. No examination has made known what may be the state of the sea to the north of the Parry Islands;* whether similar impediments may there present themselves to navigation; or whether a sea may not there exist, offering no difficulties whatsoever of the kind, as M. von Wrangell has shown to be the case to the north of the Siberian Islands, and as by strict analogy we should be justified in expecting; unless, in-

* The party, of which I was myself one, who walked from the south to the north side of Melville Island, the largest of the group, in May 1820, did not go off the land on the north side.

deed, other land should exist to the north of the Parry group, making that portion of the ocean also a land-locked sea.

"The equipment of the expeditions of MM. von Wrangell and von Anjou, for the prosecution of their researches, was formed on the presumption of the continuance to the north, (in the winter and spring at least,) of the natural bridge of ice, by which the islands are accessible from the continent: but every attempt which they made to proceed to the north, repeated as these were during three years, and from many different points of a line extending for several hundred miles in an E. and W. direction, terminated alike in conducting them to an open and navigable sea. From whatever point of the coast their departure was taken, the result was invariably the same; after an ice-journey of more or less continuance, they arrived where further progress in sledges was impossible; where, to use the words of M. von Wrangell, 'we beheld the wide immeasurable ocean spread before our gaze, a fearful and magnificent, but to us a melancholy spectacle.' [*Das unermessliche, offene meer weit ausgebreitet vor uns: ein furchtbarer, grossartiger, aber trauriger anblick!*] I need scarcely say, that the spectacle, which to them appeared 'melancholy,' because it compelled them to

renounce the object for which they strove so admirably through years of privation and toil, would wear an aspect of a totally opposite character to those whose success should depend on the facilities of navigation.

" Setting aside the possibility of the existence of unknown land, the probability of an open sea existing to the north of the Parry Islands, and communicating with Behring Straits, appears to rest on strict analogical reasoning. The distance of either group to Behring Straits is nearly the same.

" It cannot be doubted, that by calling again into action the energy, and the other admirable qualities which have been fostered and displayed in the Arctic voyages, [and which have been since exhibited in fullest vigour in the Antarctic expedition]* and by persevering through a succession of seasons, a vessel might be successfully forced from the Atlantic to the Pacific, through that confined and encumbered portion of the sea, in which all the recent attempts have been made; and that this would be deemed, and deservedly deemed, an achievement of no ordinary character; but who, that reflects on the interest which has been excited in this country for two centuries and a-half, by the question of a north-west passage;—

* This sentence is added in the present edition.

on the heroic performances of the earlier navigators in their frail and insufficient vessels;—and on all the efforts of modern times;—can forbear to wish that the crowning enterprise of so much exertion and so many hopes, may be more suitable to those expectations of a 'free and navigable' passage, which formed the reasonable basis of this long-cherished project.*

"When, in 1583, Davis sailed through the Strait which has since borne his name, his heart misgave him when he was able to discern, though in the extreme distance, 'land on both sides of him.' Notwithstanding, 'desirous to know the certainty,' he proceeded, and when he found himself in latitude 75°, in 'a great sea, free from ice, large, very salt, blue, and of an unsearchable depth,' his hopes revived, 'and it seemed most manifest that the passage was free, and without impediment.' Those who believe that the recent researches are far indeed from disproving the existence of such a passage as Davis sought,

* "It must be borne in mind, that the 'north-west passage,' and 'the determination and survey of the north coast of America,' are distinct geographical problems; the latter, in which the name of Franklin stands pre-eminent, and which by means of the recent highly praiseworthy exertions of the Hudson's Bay Company, and its officers, Messrs. Dease and Simpson, is now nearly completed, is one of the collateral fruits of the interest originally excited by the question of 'the north-west passage.'"

will undoubtedly find in M. von Wrangell's narrative a strong support to their opinion, in the probability which it sanctions, of the existence of an open sea in that portion of the passage which has not been traversed by ships, namely, between the meridians of Melville Island and Behring Straits."

EDWARD SABINE.

Woolwich,
March 30*th,* 1844.

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NARRATIVE OF AN EXPEDITION

TO

SIBERIA AND THE POLAR SEA.

CHAPTER I.

OBJECT OF THE EXPEDITION.—DEPARTURE FROM ST. PETERSBURG, AND ARRIVAL AT IAKUTSK.

From the sketch of the various surveys of the Northern Coast of Siberia, undertaken at different periods, which forms an Appendix to this Narrative, it may be seen that with the exception of the voyages of Cook and Billings, none afforded any sufficiently precise determinations as far as geography and hydrography are concerned, the different maps varying from one another as to the position of some of the most important points, by more than a degree and a half of latitude.* Above all, the whole coast from Cape Chelagskoi to Cape North, remained entirely unknown, and the account of Deshnew's voyage, from the Kolyma

* The Svätoi Noss, according to Sarychew's Map, is in lat. 70° 53′; according to Hedenström, in 71° 50′; according to Laptew, in 72° 50′.

The most northerly point between the Alaseia and the Kolyma, according to Sarytchew is in lat. 70° 07′; according to Hedenström, in 70° 27′; according to Laptew in 71° 05′.

through Behring's Straits, was so vague and obscure, that the English Admiral, Burney, founded upon that very account, his well-known hypothesis of an isthmus existing somewhere near Cape Chelagskoi, by which he supposed the continents of Asia and America to be united. Lastly, the tales of Andrejew, and more particularly the assertion of Sannikow, respecting a large country to the north of Kotelnoi and New Siberia, found many adherents in modern times, so that the geography of this portion of the Russian empire remained in complete obscurity, whilst on the other hand, the memorable researches of Parry and Franklin had led to the most exact examination and description of the northern coast of America.

To remove this blank in the geography of his country, the Emperor Alexander ordered two expeditions to be fitted out, each under the command of an officer of the imperial navy, with a view to an accurate survey of the coast of Siberia, between the Iana and the Kolyma rivers, and as far east as the Chelagskoi Noss, and to a close examination of the islands situated in the Arctic Ocean.

In obedience to this command, the Navy department equipped two expeditions in 1820, which were to proceed by land to the northern coast of Siberia, and to institute these surveys and researches. At the head of each was placed a lieutenant of the navy, who was to be accompanied by two junior officers, a medical officer who was likewise to be a naturalist, and two sailors. One of these expeditions, under Lieutenant Anjou, was to commence its operations from the mouth of the Iana; the other under my command, from the mouth of the Kolyma. My companions were, Midshipman (now Captain-Lieutenant) Matiuschkin, the Mate Kos-

min, Dr. Kyber, and two seamen, one of whom was a smith, the other a carpenter.

With respect to the objects of this expedition, and the means for their execution, the instructions given by the department of the Admiralty, say:— "From the journals and reports of all expeditions hitherto undertaken to the Polar Ocean, it appears that it is impossible to navigate it for scientific purposes, even in summer, owing to the presence of immense quantities of drift-ice. On the other hand it is known, that Serjeant Andrejew drove over the ice in the spring of 1763, with sledges; and the same was done by Messrs. Hedenström and Pschenizyn in 1809, 1810, and 1811, when the former surveyed the Bear Islands, and the latter the Liakhow Islands and New Siberia. As this appears to be the only practicable plan for the execution of His imperial Majesty's desire, its adoption has been resolved on by the department of the Admiralty, with respect to the exploring expedition now to be sent. Accordingly, the first division of that expedition is directed to proceed in sledges to survey the coast eastward from the mouth of the Kolyma as far as Cape Chelagskoi, and from thence to advance northwards over the ice, in order to ascertain whether an inhabited country exists in that direction, as asserted by the Tchuktches and others."

Such, no doubt, was the only practicable plan; namely, to undertake the expedition with sledges drawn by dogs; but to procure this first requisite, and to collect the other necessary supplies, were tasks attended by so many difficulties, in the inhospitable and uninhabited deserts of north-eastern Siberia, that it would have been impossible to overcome them without the active co-operation of

the several public officers. It was, therefore, fortunate for us, that the arrangement of everything relating to our expedition, had been confided to Privy Councillor Speranski, at that time Governor-General of Siberia, who promoted it in the kindest and most active manner, and by whose judicious measures, and kind anticipations of our most minute wants, we were happily enabled to fulfil the task assigned to us.

The following account of that part of the expedition which was entrusted to us, is simply the bringing together the notes and observations made by myself and my companions, during an undertaking in which the ordinary conveniences for such purposes were almost wholly wanting.

In publishing this narrative, I have had no other object in view, than to extend the geographical knowledge of those regions; to correct previously-existing errors; and by a plain statement of what we ourselves have done, to make ourselves useful to those who may come after us. With these views, I have ventured to be rather diffuse in the description of particular circumstances and events connected with our journey, when they happened to bear directly upon the object of our mission. In all that relates to the natural history and physical characteristics of the country, I have adhered for the most part to the observations of Dr. Kyber, who accompanied me as naturalist.

Both divisions of our expedition left St. Petersburgh on the 23rd March, 1820. In Moscow I parted from the commander of the 2nd division, Lieutenant Anjou, who waited there to obtain better means of transport for our instruments. The mate Kosmin remained with him, to take charge of the instruments belonging to our divi-

sion. Meanwhile, accompanied by M. von Matiuschkin (midshipman), I hastened to Iakutsk, that no time might be lost in setting on foot the necessary preparations for the mission with which I was charged. To make our journey as rapid as possible, we took with us only two small portmanteaus for our clothes, &c., and travelled by the ordinary post in the little carriages called *telegi*, which are changed at every station, and are adapted in every case to the nature of the road.

The overflowing of many of the rivers on either side of the Ural Chain impeded our journey, but made us amends by the variety which was thus given to the landscape; the valleys being all changed into lakes, and the rising grounds forming green islands. On the road from Moscow to Iakutsk, which is 5317 wersts in length, we experienced repeated alternations of spring and winter. At Kasan the trees were green and the meadows full of flowers, whilst in the Ural Chain, the summits of mountains, and the narrow ravines which were shaded from the sun, were covered with snow. At Tobolsk the grass was only just beginning to appear in the pastures, whilst the romantic Krasnoiarsk showed all the luxuriance of spring, and the gardens at Iakutsk were in full flower. The rapidity of our journey placed every contrast in the most striking light. We passed in a few days from the magnificent palaces of St. Petersburg and Moscow, to the huts of the wandering Tunguses; from the vast oak and lime-tree forests of Kasan, to the desert and snow-covered banks of the Alaseia and the Kolyma.

After passing the Ural Chain, which is here well named the "Stony Girdle," and entering Siberia Proper, we were agreeably surprised by the kind

manners of the inhabitants, who spared no pains to enable us to prosecute our journey with the least possible delay. Whether by day or by night, our things might be safely left unwatched on the high road whilst we were changing carriages; and if we expressed uneasiness about them, the answer was always "Never fear, nothing is stolen here." Those whose ideas of Siberia are associated with criminals and exiles inhabiting a cold and desolate wilderness, would find instead, in this southern part at least, luxuriant vegetation, well-cultivated fields, excellent roads, large well-built villages, and general security and comfort.

On the 18th of May we reached Iakutsk, and alighted at the house of M. Kutygin, whose hospitality I shared during the month of my stay. I immediately announced myself to the Governor-General of Siberia, M. von Speranski, by whose kindness and support I was speedily enabled to complete the arrangements for our ulterior proceedings. He showed me the correspondence which he had had, on the subject of our expedition, with the authorities of the different provinces through which we were to pass, in order that I might point out to him anything which might still be wanted. M. Hedenstrom, who had visited the coast and islands of the Polar Sea in 1811, came, at the request of the Governor-General, to meet me at Iakutsk, and his conversation and manuscripts afforded me most valuable information.

Early in June Lieutenant Anjou and the other members of the expedition arrived at Iakutsk with the instruments, and on the 25th of June we left the capital of Siberia full of gratitude for the kindness, friendship, and sympathy which we had enjoyed there; and which we prized the more, as we

were now to take our leave of the civilized world, and of all the enjoyments of social life.

On the 27th of June we arrived at the village of Katschuga, 236 wersts from Iakutsk, situated on the left bank of the Lena, which is navigable from thence. We found here a large flat-bottomed decked boat, which we loaded with the provisions which had been brought together by the orders of the Admiralty at Iakutsk, and on the evening of the 28th of June we began to descend this majestic river.

Katschuga is a kind of entrepôt for all goods which are to be sent by water to towns or places near the Lena. They are sent partly by large and heavily-laden barks, which are broken up for building-materials or for fire-wood on their arrival at Iakutsk (as they are too large to return against the stream) and partly by smaller boats, which can be rowed or towed up the river again: there are also a few good-sized decked boats with sails.

Travellers who have but little luggage make use of small light boats, which always keep near the windward bank for safety. The traveller is entitled to demand, at every post station, as many rowers as there are horses marked on his travelling pass. In this way he gets on without interruption, and speedily, especially if he is going down the stream.

These are as yet the only provisions made for an internal navigation, which is of the highest importance in a country like Siberia, where settlements are often many hundred wersts apart, and where the northern provinces have to depend for the necessaries of life on the cultivated provinces in the South. Few countries in the world are favoured with such abundant river communication as Siberia. The great rivers flowing from South

to North seem intended by nature to convey the superfluities of the South to the inhabitants of the barren North; and the country is intersected, besides, by such a number of navigable streams, that there is hardly a point of any importance which cannot be reached by water. Some meal, salt, tea, sugar, brandy, tobacco, and a few cloth stuffs, are indeed sent in boats from the yearly fair at Iakutsk to Shigansk, and other places on the Lower Lena; but from the imperfection of the boats, and the want of men, the passage is often so long, that winter comes on before they arrive at their destination. They have then to wait till spring, and though a part of the most indispensable articles are carried by land, this enhances the price so enormously, that very little is sent in that way. The arrival of these stores is a subject of painful anxiety to the inhabitants; their non-arrival often causes severe and general sickness. The stores which are left are sure to be more or less injured, and the custody of them during the winter is a heavy charge upon the settlers on the banks of the river, who are held responsible for whatever belongs to the crown.

All these serious disadvantages might be obviated by the employment of a steamer, by the assistance of which, vessels could reach the most distant places on the Lower Lena in a month from Katschuga; and thus the passage could be made twice in the course of the summer. The whole district between Iakutsk and the sea, about 4000 wersts, would receive new life, industry would be encouraged, and severe suffering and privation averted; the forests on the banks of the Upper Lena offer inexhaustible stores of cheap and easily accessible fuel, the preparation of which would

afford additional employment and profit to the natives.

I return to our own navigation. With the occasional assistance of sails or oars, our boat glided rapidly down the river between high and romantic banks. The Lena is one of the largest rivers in the world: from Katschuga to Rigi, a distance of 400 wersts, the country is mountainous and covered with impenetrable forests, and the banks of the river offer a succession of views of picturesque and varied beauty. On the slopes of the hills, we saw cultivated fields, pasture-grounds and vegetable-gardens, surrounding the cottages of the peasants, which sometimes stood singly, and sometimes formed little villages.*

There are many wooded islands in the bed of the river. The banks became steeper, and the mountains more lofty, as we approached Rigi, where the river takes a sudden bend to the East; and the mountains appear to close in upon it, and divert it from its course. Lower down it escapes from the hills, and flows on in a still broader stream, between flat banks. Below Rigi there are a few shallows, which in some degree impede the navigation, when the water is low: when these are past, the flat vessels in common use meet with no impediment throughout the remainder of their course. The first permanent winter-habitation of the Russians on the banks of the Lena was built in 1631, at the mouth of the Kuta, a tributary stream from

* The inhabitants suffer much from inundations, which, particularly when the river is swollen by the melting of the snow in the valleys, often ruin their little farms for the year. At such times they have recourse to the government magazines, which are yearly filled from the fruitful districts of Iakutsk and Krasnoiarsk, and from which they can purchase corn at a moderate price.

the westward. The Lena was first discovered by the Turuchanschi in 1607, and afterwards by Cossacks from the Ienissei in 1628.

Between Saborie and Kirensk the Lena winds so much that the distance by water is 105 wersts, and in a straight line is only thirty-five wersts. The river here is seven fathoms deep, and has scarcely any current. At Kirensk, the left bank consists of black slate rock, with some talc. A few wersts below I saw strata of chloride slate, in red clay. About 100 wersts lower down, the right bank consists of common clay and imperfect slate. At Schtscheki, 250 wersts below Kirensk, the rocks on the left bank are limestone, interspersed with veins of flint and calcareous spar. The banks become low and flat 350 wersts above Olekma. Here there are a quantity of fragments of greenstone porphyry, common quartz with mica, and much mica-slate. About 150 wersts above Olekma, the left bank, which is high, consists of layers of different coloured slate; the green layers are thick, and the intervening gray layers are very thin; occasionally I saw small veins of gypsum interspersed; at Olekma the left bank consists entirely of clay, with rather thick layers of grey slate, and a beautiful dazzling white gypsum. About 180 wersts above Iakutsk, the right bank of the river consists of perpendicular rocks, which are called from their form *Stolby*, or the pillars: there are here several kinds of marble. About sixty wersts below Stolby, there are many excavations in the bluff limestone rocks. These are probably the remains of former attempts to discover silver ore. Dr. Kyber saw in one of these caves a larch-tree growing from the rocky floor, at the depth of several fathoms, and flourishing in spite of the

constant darkness. To these scanty notices concerning the banks of the Lena, I may add the mention of two mineral springs on opposite sides, 150 wersts below Stolby. The one on the left bank issues from a steep limestone rock, and has a sulphurous smell, and a high temperature; the other (on the low bank on the opposite side) is cold, very clear, and has a strong salt taste.

The town of Kirensk is a poor little village, chiefly deserving of notice for the success of the inhabitants in cultivating vegetables. They send to Iakutsk, cabbages, potatoes, turnips, and sometimes even cucumbers. The gardens are all so placed as to be sheltered from the North and East, by hills, rocks, or woods.

About 250 wersts below Kirensk, the Lena passes between precipitous rocks, nearly 500 feet high; the depth of the river in this part is twelve fathoms. This place is remarkable for an echo, which repeats a pistol-shot at least a hundred times, increasing in the intensity of the sound so as to resemble a well-sustained running fire of musketry, or even a cannonade. They told us here the story of a hunter, who, on his snow-shoes, had pursued an elk to the edge of the precipice. In the ardour of the chase, both man and beast had been precipitated on the ice of the river, eighty fathoms below. Near this place we passed a steep rock in the bed of the river, where a bark laden with brandy had been wrecked some time before; it is a little above the mouth of the Witima, which is celebrated for the quantity of talc found on its banks, and still more for its beautiful sables, which are esteemed the finest in all Siberia, after those of Olekma. The forests on the right bank of the Lena, are rich in fur-animals of all kinds, and the furs are remarkably fine; where-

as on the left bank, the skins are of an inferior quality, as well as much more scarce. This might be expected, as the vast woods which cover the right bank of the river are in immediate connexion with the forests of the Iablonnoi Stanowoi Chrebet,* into which the most adventurous fur-hunters have not yet penetrated, whereas the left bank is more lightly wooded, and better inhabited.

On the 9th of June we found ourselves opposite the town of Olekma.† We had here heavy rain, and such a violent wind setting against the stream as to bring us to a stand still. We had recourse to a practice in use here in such cases, and which succeeded perfectly in ours. We bound four larch-trees together in a row, and by attaching stones to them we suspended them about a fathom under water; their tops were downwards and their roots were attached by cords to the fore part of our vessel. As the wind had no effect on the water at that depth, the under current impelled us forwards by means of this kind of watersail, in spite of the force of the wind and the surface waves.

Notwithstanding the heavy rain, we saw, as we continued our voyage, large tracts of burning forest. The bushes and dry underwood were for the most part already consumed. The giant pines and larches

* This is the name of the chain of mountains which extends southward on the east side of the Lena, and connects itself with the Baikal mountains.

† The sables of Olekma are the best in Siberia: 50 or 100 roubles a piece, or even more, are sometimes given here for skins of remarkable beauty. Those which have a blueish cast are the most prized. The gray squirrels of this district, which are distinguished for their very thick, long, and dark gray hair, are also much sought after, and fetch a high price. Olekma is therefore a place of importance on account of the fur-trade. It may moreover be regarded as the climate of corn-cultivation in Siberia: there is none to the North of Olekma, and the winter rye, which is the only grain cultivated at this place, not unfrequently fails.

still stood enveloped in flames; and offered a magnificent spectacle, especially at night, when the red light was reflected by the waves of the Lena, and nothing was heard but the loud crackling of the resinous pines. These forest-fires often desolate hundreds of wersts, and almost always originate in the carelessness of hunters or travellers, who neglect to extinguish the fires which they have lighted to dress their food, or to drive away the clouds of musquitoes which darken the air, and are an almost insupportable torment. Besides the destruction of the trees, these fires have the bad effect of driving the fur-animals and game of all kinds to more remote and undisturbed districts. Yet the hunters, who are the greatest losers, are not cured of this destructive carelessness.

The further north we proceeded, the more desolate the shores of the Lena became in every respect. We had seen at Olekma the last traces of either field or garden cultivation: beyond it the natives subsist entirely on the produce of their cattle, hunting, and fishing. There are scarcely any settlements except the post-stations, and the few inhabitants appear miserably off. Those who came to us were in rags, and bowed down by want and sickness. This is especially the case with the Russian settlers, who are found as far north as within fifty wersts of Iakutsk. Further north the population consists entirely of Iakuts; who as the true aborigines, know how to encounter the climate better, and suffer less from its severity and privations.

After having stuck fast one whole night on a sandbank, we landed at Iakutsk on the 25th of July, having taken twenty-five days in the passage from Katschuga, a distance of 2500 wersts. In

spring, when the current is more rapid, and contrary winds are rare, this journey does not take more than thirteen or fourteen days.

At Iakutsk we were most kindly received by the Commandant M. von Minizkoi, in whose house M. von Anjou and myself remained during our stay; we were indebted to him for much valuable information and advice relative to our travels in a country, which he has thoroughly studied in a residence of many years, and in frequent journeys through great part of Siberia. During the whole time that the expedition remained in the province under his command, his watchful care and assistance were of essential service in supplying its wants, in a country so deficient in resources; and doubtless contributed essentially to the success of our enterprise.

Iakutsk has all the character of the cold and gloomy north. It is situated on a barren flat, near the river. The streets are wide, but the houses and cottages are poor in appearance, and are surrounded by tall wooden fences. Amongst so many dry boards, there is not a green tree or bush to be seen; there is nothing to tell of summer, except the absence of snow, which is perhaps rather a disadvantage in point of appearance.

The town has 4000 inhabitants. It consists of about 500 houses, five churches (three built of stone and two of wood), and a convent. A stone building for commercial purposes has since been erected. The only antiquity is an old wooden fortress or ostrog, with its ruined tower, which was built in 1647 by the conquerors of Siberia, the Cossacks. The inhabitants take pride in this monument of the exploits of their ancestors, and are in general proud and fond of their native city,

whatever strangers may think of it. The town has undergone great improvements in the last thirty years. The Iakutian Yourtes, which Captain Billings saw here in 1793, have been replaced by substantial houses; the windows of ice or of talc have given way to glass, in the better class of houses, and the more wealthy inhabitants begin to have higher rooms, larger windows, double doors, &c. These are signs of increasing prosperity, under the wise and fostering care of the excellent governor of the province.

Iakutsk is the centre of the interior trade of Siberia. All the most costly furs, as well as the more common kinds, walrus teeth, and mammoth bones, those curious remains of an earlier world, are brought here for sale or barter during the ten weeks of summer, from Anabor and Behring's Straits, from the coasts of the Polar Sea, and from the mountains near Olekma, from the Aldan and from Udskoie, and even from Ochotsk and Kamtschatka; the whole value often exceeds two and a-half millions of roubles.*

As soon as the Lena is clear of ice, the merchants begin to arrive from Iakutsk, bringing with

* The sorting of the sables is a business requiring very great experience and skill. They are classed according to the thickness and length of the hair: its colour, not only at the tip, but also near the root; and the thickness of the skin. All these qualities must be combined, in a high degree of perfection, in order to form a good assortment. It is often necessary to examine more than a thousand skins, to complete one good tippet. The tails, paws, and light-coloured parts of the skins, are joined together and sold separately. [In 1836 there were sold at Iakutsk 500 Beaver skins, 615,000 Squirrels' ditto 200 Otter, 2,000 Marten, 20,000 Stone Foxes, 45,000 Ermine, 18,000 Sable, 35,000 Marmot, 10,000 Musk, 1,000 pood weight of Walrus teeth, and 1,900 pood of Mammoths' tusks.]—The portion of this note which is included between brackets, is added to the present edition from a MS. communication from Admiral von Wrangell.—EDITOR.

them for barter corn, meal, the pungent Circassian tobacco, tea, sugar, brandy and rum, Chinese cotton and silk stuffs, yarn, cloth of an inferior quality, hardware, glass, &c.

At the annual fair of Iakutsk one sees none of the popular amusements common at fairs in Europe; there is not even the appearance of animation and bustle which might naturally be expected. The goods are not exposed for sale, and most of the purchases are effected in the houses or enclosures of the citizens. The strangers appear generally to wish to conceal from each other the particulars of their dealings, which are almost exclusively with the inhabitants, and scarcely ever with each other. Almost all the Russian settlers in Iakutsk employ their little capital in purchasing by degrees from the Iakuts during the winter, a collection of furs, on which they realize a good profit at the time of the fair, when they sell them to the merchants from Iakutsk. The Russians live entirely by trade, and have abandoned all sorts of handicraft to the aboriginal Iakuts, amongst whom there are now excellent carpenters, cabinet-makers, carvers in wood, and even painters. The pictures of saints, the carving and interior fittings in the new church at Iakutsk, are by Iakuts and are neatly executed.

The inhabitants are not in an advanced state of intellectual cultivation: books are extremely rare: education is but little thought of; the children usually pass the first years of their infancy with a Iakut nurse, from whom they learn so much of her native language, that I often found the conversation of persons in the best society, very difficult to understand. As the children grow up, they learn a little reading and writing from the priests. They are then gradually initiated into the mysteries of

the Siberian fur-trade, or obtain places under government. Their hospitality is proverbial, but as there are usually but few strangers, they can for the most part exercise it only towards each other. They pass much of their superabundant leisure in somewhat noisy assemblages, where eating and drinking play a principal part. After dinner, which is a very substantial meal, and at which *Naliwki* (a kind of liqueur made of brandy, berries, and sugar,) is not spared, the elderly gentlemen pass the afternoon with cards and punch, the ladies gather round the tea-table, and the young people dance to the sound of a kind of harp with metal strings, which is the only instrument they possess. I have heard some old people complain that the love of play, dress and expense, have increased so much of late, that many families have been ruined thereby. My stay was not long enough to judge, how much of this complaint arose from the natural disposition to regard the time of one's youth as the good old time, and as preferable to the present.

By M. von Minizkoi's exertions, we were enabled to prosecute our journey before the end of the summer. Early in August, Lieutenant von Anjou descended the Lena with his division of the expedition. About the same time I sent M. von Matiuschkin forward to Nijnei Kolymsk, to prepare for our arrival; and as soon as the morasses and rivers were frozen, the stores for the use of the expedition were despatched under the charge of M. Kosmin. My own departure for Kolymsk took place on the 12th of September.

CHAPTER II.

JOURNEY FROM IAKUTSK TO NIJNEI KOLYMSK.

Pack Horses.—First Bivouac.—The Iakuts.—Iakut Settlement.—Miurui.—Yourtes.—Clothing, Customs, Songs, Food, Villages, National Characteristics.—The River Aldan.—The River Tukulan.—Forest Bivouac.—Verkhoiansk Mountains.—Wandering Tunguses.—Baralas and Tabolog Stations.—Saschiwersk.—Inhabitants of the District.—The River Alaseia.—The Sardach Station.—Sredne Kolymsk.—Winter Travelling Costume.—The Omolon River.—Dogs and Sledges.—Arrival at Nijnei Kolymsk.

REGULAR travelling ends at Iakutsk: from thence to Kolymsk, and generally throughout Northern Siberia, there are no beaten roads. The utmost that can be looked for, are foot or horse tracks leading through morasses and tangled forests, and over rocks and mountains. Travellers proceed on horseback through the hilly country, and on reaching the plains, use sledges drawn either by reindeer or dogs.

On what is called the Iakutsk road, which crosses from the right bank of the Lena to the Aldan, there are post-stations for changing horses at distances of from fifteen to forty wersts. In summer, travelling is almost exclusively by water. I began my journey by crossing in a boat to the opposite side of the river, where we expected to find horses

waiting for us. My companions were, a sailor who had accompanied me from St. Petersburg, and a retired serjeant from Iakutsk, who had been with M. Hedenstörm to the shores of the Polar Sea, and whose experience and ability were subsequently of great service to the expedition. He was also my interpreter. We had ordered thirteen horses, three for ourselves, and the remainder for our provisions, instruments, winter-clothing, and other necessaries.

When we landed at the post-station neither men nor horses were to be seen; this was a bad beginning, but the serjeant said it was a common occurrence, and that the Iakuts had probably taken their horses to a valley three wersts off, where there was better pasture. We sent the boatmen to look for them, and meanwhile lighted a good fire on the beach, and made some soup to fortify ourselves for the journey. The weather was raw and cold, and the country showed every symptom of approaching winter.

In three hours the men and horses arrived, and we commenced loading them: each horse carries about 5½ pood, (220 Russian pounds,) 2¼ pood on each side, and half a pood on the back. The horses are then fastened in a string, the bridle of each being tied to the tail of the next. Our string of ten horses was managed by only two postilions, one riding the leading horse, and the other the hindmost one. These drivers have no easy task; the horses sometimes stick fast in the morasses, or stumble on the rocks, and amongst the precipices, or break loose and try to roll off their burthens; and the men must be ever on the watch to remedy all disasters. Long practice makes them so expert at this, that an experienced Iakut will sometimes take the sole charge of twenty-eight horses,

and bring them in safe. In such case, of course, he has to be more often on foot than on horseback.

As the party proceeded but slowly I rode a-head with my two companions, and came to several little lakes swarming with wild fowl, of which we soon shot several for our supper. At the close of the day we reached another post-station, where we were to pass the night. As the Yourte was filled with men and cattle, I was glad to avoid the closeness and other inconveniences withinside, and passed a very comfortable night under the larch-trees, with my bear-skin for a mattress, a covering of furs, and a bright blazing fire. The next morning was clear and frosty, but 28° Fah. felt rather cold in dressing, and I thought, with something of a shudder, of the approaching winter, when several degrees below freezing would be called by the natives warm weather. However, man is a creature formed for all climates, and necessity and determination soon reconcile him to anything. A few weeks later, I had learned to think eighteen or twenty-two degrees below the freezing point mild weather.

Tea and soup were prepared, and breakfast eaten whilst the horses were loading, and we resumed our march. Our way led over a hill covered with pines, and I noticed that several old trees near the path had tufts of horse-hair fastened to their branches, and that a number of sticks were stuck in the ground near them. Our leading postilion got off his horse, plucked a few hairs from the mane, and fastened them to the tree with much solemnity of manner. He told us that this was a customary offering to the spirit of the mountain, to obtain his protection during the journey, and that foot-passengers placed a stick in the ground

with the same intention. This is a general practice amongst the Iakuts, and is even persevered in by many of those who have professed Christianity. My Iakuts sang almost incessantly. Their style of singing is monotonous, and rather melancholy, and is characteristic of this gloomy and superstitious people; their songs describe the beauties of the landscape in terms which appeared to me exaggerated, and which I attributed at first to a poetic imagination, but my serjeant told me it was usual to try to propitiate the spirit of the mountain by this flattering description of his territory.

On the 13th of September, we travelled sixty-three wersts with one change of horses. The Yourte where we were to sleep had been so highly praised for its roominess, convenience, and above all, its cleanliness, that I expected an excellent night's rest; but, though heavy rain obliged me to stay in it, I found in this, as in every other case, that one must be a native-born Iakut to find the atmosphere of a Yourte endurable.

We passed on the next day numerous little lakes, which gave a peculiarly pleasing character to the landscape, from their regular oval form, their high wooded banks, and the mirror-like stillness of their sheltered waters, broken only by the plash of the startled wild fowl. When we had gone about forty wersts, we came to the valley of Miurui, which was one of the most interesting spots in my journey.

This valley has a tolerably regular oval form, and is eight wersts in diameter. It is entirely surrounded by a kind of wall, which is in some places ten fathoms high, and must have been at some former period the bank of a considerable lake, which is now dry. There are still, in the

lowest part of the valley, some small but very deep lakes abounding in fish, This, and the sheltered situation, and luxuriant pasture, induced a rich Tungusian chief called Miurui to settle here with his tribe. They were subsequently driven out by Iakuts who had come from the south, but the valley still preserves the name. It is one of the most populous and flourishing settlements between the Lena and the Aldan. Numerous Yourtes, some approaching to the dimensions of Russian houses, two good churches with towers, the bustle of a number of inhabitants, large droves of cattle and horses, offered a striking contrast to the surrounding desert. This remarkable settlement owes much of its prosperity to the Iakut Golowa or superintendent, who has built and endowed the two churches at his own expense. His fortune is said to amount to half a million of roubles, nevertheless he has in no respect altered his original national customs. He lives in a Yourte, warms himself by a true Iakutian Tchuwal, or open hearth, drinks his Kumys,* eats horse-flesh, and in every thing but the Christian religion, keeps close to the manners of his forefathers. The chief branches of industry in this place are, the care of cattle, the chase, the fur-trade, and the breeding of horses.

I will notice here, in passing, a few of the principal characteristics of this people. Their countenance and language fully confirm the tradition

* This well-known beverage, prepared from mares' milk, is made here in the same manner as in Tartary; only the Iakuts have happily not learnt, like the Tartars, to make it intoxicating. It is an agreeable beverage, and so nourishing, that a couple of large skins full of kumys, hung to the saddle, are often the only provisions taken for a foraging excursion of a few days.

of their descent from the Tartars.* They are properly a pastoral people, whose chief riches consist in the number of their horses and horned cattle, on the produce of which they subsist almost entirely. But the abundance of fur-animals in their vast forests, and the profit which they can make by selling them to the Russians, have turned a large part of their attention to the chase, of which they are often passionately fond, and which they follow with unwearied ardour and admirable skill. Accustomed from infancy to the privations incidental to their severe climate, they disregard hardships of every kind. They appear absolutely insensible to cold, and their endurance of hunger is such as to be almost incredible.

Their food consists of sour cows' milk, and mares' milk, and of beef, and horse-flesh. They boil their meat, but never roast or bake it, and bread is unknown among them. Fat is their greatest delicacy. They eat it in every possible shape; raw, melted, fresh, or spoilt. In general they regard quantity, more than quality, in their food. They grate the inner bark of the larch, and sometimes of the fir, and mix it with fish, a little meal and milk, or by preference with fat, and make it into a sort of broth, which they consume in large quantities. They prepare from cows' milk what is called the Iakut butter. It is more like a kind of cheese, or of curd, and has a sourish taste; it is not very rich, and is a very good article of food eaten alone.

Both men and women are passionately fond of

* According to this tradition, their ancestor was a Tartar, named Sachalar, who came from his own country on the other side of the mountains, to Kirenga on the Lena, where he settled and married a Tungusian woman; the Iakuts still call themselves Sachalary.

smoking tobacco. They prefer the most pungent kinds, especially the Circassian. They swallow the smoke, and it produces a kind of stupefaction which nearly resembles intoxication; and if provoked when in this state, the consequences are dangerous. Brandy is also used, though the long inland carriage renders it extremely dear. The Russian traders know how to avail themselves of these tastes, in their traffic for furs.

The Iakutian habitations are of two kinds. In summer they use Urosses, which are light circular tents formed of poles, and covered with birch-bark, which they strip from the trees in large pieces. These strips are first softened by boiling, and are then sewed together; the outside being white, and the inside yellow, the Urosses have a very pleasing appearance, and at a distance resemble large white canvas tents. In the summer they wander about with these in search of the finest pastures; and whilst their cattle are feeding, they are themselves incessantly employed in preparing the requisite store of winter forage.

At the approach of winter they occupy their warm Yourtes. These are cottages formed of thin boards in the shape of a truncated pyramid, and covered thickly on the outside with branches, grass, and mud. A couple of small openings which admit a scanty light, are closed in winter by plates of ice, and in summer by fish-membrane, or oiled paper. The floor is generally of beaten mud, and is sunk two or three feet below the ground; but richer people have it raised and boarded. There are wide permanent benches round the walls, which serve for seats in the day-time, and for sleeping on at night; and are generally partitioned off for this purpose, accord-

ing to the occupants. In the middle, but rather nearest the door, is the Tchuwal, a kind of open hearth with a chimney up to the roof, where a constant fire is kept burning. Clothing, arms, and a few household articles, hang round the walls, but in general the greatest disorder and want of cleanliness prevail.

There are usually sheds outside for the cows, which in winter are placed under cover, and fed with hay, and even brought inside the Yourte in extreme cold weather; whereas the horses are left out to shift for themselves as well as they can during the winter, by scraping away the snow to get at the withered autumn grass. It is only when they are about to make a journey that they are given hay for a few days previously.

The above-described habitations, though rude, are better adapted to the wants of the people than those built after the Russian fashion, a few of which are to be seen. In the construction of the Yourtes small trees may be used instead of boards, which is a great convenience; and the continual change of air, maintained by the constant fire in the Tchuwal, tends to purify the close atmosphere, and is more wholesome than a stove.

Every tribe of Iakuts is divided into several Naselis, each of which is under a chief or Knäsez, by whom minor disputes, &c., are settled. More serious cases go before the Golowa, or superintendent of the whole tribe, who is elected from amongst the Knäsez. The people often call in a Shaman or conjuror, and have recourse to his incantations to recover a strayed cow, to cure a sick person, or to get good weather for a journey, &c. &c. The Iakuts have almost all

been baptized; a part of the New Testament, the Ten Commandments, and several of the Rules of the Church, have been translated into their language, but as yet the greater number have no idea of the principles and doctrines of Christianity; and their Shamans, and the superstitions of heathenism, retain their hold upon their minds. As a nation, they are unsocial, litigious, and vindictive. An injury received by one of them is very rarely forgotten, and if he cannot revenge it himself, he will leave the feud to his son. Their spirit of litigation is excessive; they will often undertake difficult and expensive journeys, in a cause where perhaps the matter in dispute is not of the value of a rouble. Their unsocial disposition, which leads them to prefer settling by single families at a distance from each other, is strongly contrasted with the cheerful and ready hospitality which they show to a stranger. They very rarely settle in communities; it is only along the route from Iakutsk to the Aldan, where the country is more populous, that such settlements are now and then to be met with, but beyond the Verkhoiansk chain, the solitary Yourtes are often hundreds of wersts apart, so that the nearest neighbours may not see each other for years. Such distances are far greater than can be required on account of pasture, and are rather to be ascribed to the disposition which leads them to seek solitude, and to avoid all social intercourse.

As soon as I had arrived at Miurui, the Golowa came to see me, accompanied by a Knäsez and two clerks. They complained much of being oppressed by the Cossacks from Iakutsk. I tried to pacify them, by telling them of the new re-

gulations by which the Cossacks were to be given lands to cultivate, which it was to be hoped would put a stop to such irregularities. We continued our journey on the 15th, and though the roads were bad, and the horses sank up to their necks in a morass, accomplished ninety wersts, and slept at Aldanskaia, half a werst from the Aldan, which falls into the Lena ninety wersts from here. There are no settlements between this place and Baralas, 400 wersts distant: the intervening tract is desert and mountainous, with many morasses, on which account travellers usually wait for dry or frosty weather, to enable them to pass it. They also select the strongest horses they can procure, and take spare ones to replace those which may be knocked up. We were favoured by the weather, which was frosty, and were therefore only detained one day to procure the necessary provisions. The district between the Lena and the Aldan is characterized by elevations, forming parallel ridges like waves, from East to West. Between the hills there are numberless caldron-like hollows, forming marshy valleys on the North side, and lakes on the South side. The heights of land are generally well wooded with larch; the soil is clay mixed with sand; the northern declivities appeared to me much steeper than the southern.

The Aldan is here one werst and a-half in breadth; its current is rapid, and it flows in a westerley direction. We saw in the distance, on the North side of the river, a range of peaked mountains covered with snow.

On the 17th we were ferried across the river with our horses and luggage, in a flat-bottomed

boat, which sprung a leak when half-way over; and in spite of baling with caps and hats, we must have sunk, but for a little island, on which we landed, and stopt the hole with dry moss and grass. That night we pitched our little travelling tent of tanned rein-deer leather.

We proceeded at break of day on the 18th, through a desert and marshy district, and on coming to some tolerable pasture, it was thought advisable to halt, that the horses might avail themselves of it, as it was the last for a considerable distance. Meanwhile, as heavy snow was falling, we were glad to cluster round a little fire under the tent, and to enjoy our chief refreshment—tea. Next day was a laborious one; after passing the marshes, we had to make our way through a thick wood of larch, poplars, and willows, to the only spot where the Tukulan could be forded. We pitched our tent on its wild shores. Before us were the snowy mountains, behind us the forest, and the silence around was only broken by the loud rushing of the torrent. We crossed early in the morning on the 20th, the current was formidable, and the water up to our saddles; but the bottom of the ford was hard, and we passed safely, though thoroughly wetted. We had to cross other streams less broad, but equally rapid. We found the valley of one of these so strewed with trunks of trees and masses of rock, brought down by the torrent when swollen by the melting of the snows in spring, that our horses made their way with difficulty. Winter seemed to have commenced; the thermometer was at 21°, and the ground was covered with snow. We were rather pleased with this foretaste of a nomade winter life. We

chose for the night a clear spot of ground between high trees, which afforded some protection from the weather; we then swept away the snow, and dragged to the place so cleared the withered trunk of a tree, which formed the foundation of a blazing fire that sent its light far and near. Our guides soon strewed the ground round the fire with a quantity of dry branches, on which they placed a layer of the green branches of the dwarf cedar. On this fragrant carpet we pitched our three little tents, forming three sides of a square round the fire. Our guides thought the snowy ground on the fourth side quite good enough, and used their saddles for pillows. Whilst we pitched our tents, they unloaded the horses, rubbed them down with dry grass, and fastened them to the trees, that they might not eat snow or damp grass till they were cool.

The kettle was soon filled, tea and soup prepared, and our little country pipes lighted. After supper our guides entertained us with wonderful hunting stories, and travelling adventures. One told of a Cossack who had killed three bears at once—one with his knife, a second with his hatchet, and the third with a noose; another talked of the enormous strength of the Siberian elk, which he affirmed could tear up large trees by the roots, at full speed. Both the Iakuts and Russians, in this country, have few pleasures so great as telling stories of this kind. It was late before we crept under our little tents, where we slept soundly and comfortably in our bear-skins and furs. Before lying down to rest, the guides set their horses at liberty, to seek for grass under the snow.*

* The nature of these northern horses seems quite suited to the climate. They are of middle size, have a short thick neck,

Travellers do not always enjoy such undisturbed repose at a place of this kind. In spring and summer the melting snows often cause such sudden floods, that it is considered a prudent precaution to select one's sleeping-place near some large tree, which will afford a tolerably commodious retreat in case of such an accident.

As we approached the source of the Tukulan the valley gradually became narrower, the rocks steeper, and the trees more thinly scattered, until they disappeared entirely. The most abundant trees along the side of the river had been willows, and a remarkably large and lofty species of poplar. Birch and fir occupied the drier and more stony grounds; and the dwarf cedar covered the slopes of the mountains. Its small, but well-flavoured nuts, attract numbers of black bears and squirrels. Multitudes of grouse breed in the thick larch and pine woods.

On the 22nd we slept at the foot of the mountains, under the shelter of an overhanging rock, there being no trees. At day-break the thermometer was — 4°. We were now to cross the Verkhoiansk range, which is unquestionably the most difficult and dangerous part of the whole road from Iakutsk to the Kolyma. We had to climb steep precipices, where, from the frequent

and are very strong-boned in proportion to their size. Most of them are of a grayish colour; they have very long rough hair, and like the other quadrupeds of this region, change their coats *in the middle of summer*. They perform most laborious journeys, often of three months' duration, with no other food than the half-withered grass, which they get at by scraping away the snow with their hoofs, and yet they are always in good condition. It is remarkable that they keep their teeth uninjured to old age; may this be attributed to their never having hard corn, like our horses, but always soft grass? They are much longer lived than our horses, and are usually serviceable for thirty years.

giving way of the snow, we were often in danger of falling to the bottom; and when we came to hollows and narrow ravines, we had great labour in clearing away the snow sufficiently to force a passage.

Our guides told us that the gusts of wind from the valleys were sometimes so sudden and violent, that whole parties had been precipitated by them into the abysses, along the margin of which the path ran. We were particularly favoured by the weather. The sky was cloudless, and when we were at the summit* of the pass the ice-coated rocks around sparkled in the beams of the noon-day sun, as if covered by the most brilliant diamonds. Below us, to the North, opened the valley of the Iana, which flows into the Polar Sea; bluff rocks shut in our prospect to the South; it was indeed a wild scene.

This range divides the tributaries of the Lena from those of the Iana: it consists chiefly of pure black slate, and is steeper on the South than on the North side. It is in latitude 64° 20′, according to our observations, and forms a remarkable line of separation in respect to vegetation. Neither pines, firs, nor service trees (Eberäschen), which last were occasionally to be met with hitherto, are found to the North of it. Larches, poplars, birches, and willows, continue as far as 68°; willows even grow in sheltered places near the Omolon and the Aniui rivers.

Some Tunguses, whom we met with further on,

* The highest part of the pass is, according to barometrical measurements by Lieutenant Anjou, 2100 feet above the level of the nearest point on the Tukulan, thirty wersts distant. The summits above us seemed to be 800 or 1000 feet higher than the pass.

assured us that a fish known here by the name of Charjus *(Salmo thymallus)*, was abundant in the lake in which the Iana takes its rise.

There is hardly a worse route in Siberia (with the exception of dangerous mountain-passes) than that from the Aldan to this place, through morasses, forests, torrents, and rocks, and entirely unprovided with any shelter;* whereas on the other side of these hills the path has been conducted over the most favourable ground, avoiding the worst morasses, and has been occasionally widened, or otherwise improved. The route is one of some importance, as salt and provisions have to be sent by it yearly to the settlements on the Iana and Indigirka. Another great advantage on the northern side consists in the erection, at certain intervals, of huts, built of rough stems of trees, and called *Powarnas*, or cooking-houses. There is no regular fire-place in them, but a sort of hearth: and an opening in the roof serves to let out the smoke: the traveller through these wild wastes at night, or when overtaken by a snow-storm, knows how to value this rude shelter.

The valley of the Iana has a northern direction, and is bounded to the East and West by peaked mountains, which connect themselves to the South with the Verkhoiansk range, and to the North gradually sink into lower hills, scattered over a morassy plain. Another chain, of some importance, extends from this place in a W.N.W. direction, towards the Polar Sea, and divides the valleys of the Lena and Iana. It is called the Orulganski

* Since 1821 the government at Iakutsk have made improvements in this part of the road, and have built several Powarnas.

Chain, and consists, like all the heights I had hitherto seen, of clay-slate, of which the strata run W.N.W., sloping alternately to the East and to the West.

We proceeded along the left bank of the Iana, and on the 25th, near one of the above-mentioned Powarnas, we came upon a little hut, formed of branches of trees, which at first we thought could not be inhabited. To our astonishment, there came out of it a Tunguse, who had settled in this desert with his daughter and a couple of dogs, for the purpose of hunting rein-deer. One must have known the climate, and seen the country, and the half-transparent hut, to imagine the situation of these two persons. The poor girl was most to be pitied. Often alone for days together, whilst her father was absent in pursuit of game, in a wretched hut, which could hardly afford sufficient shelter from the wind and rain, even in summer, thus helplessly exposed in total solitude to the most intense cold, and often to hunger, and in entire inactivity. The man was one of those Tunguses, who having had the misfortune to lose their tame rein-deer, are obliged to separate themselves from the rest of their tribe, and to seek subsistence in the wilderness. They are called, in the language of the country, "Fortune-hunters;" few long survive the continued conflict with cold, hunger, and dangers of every description. The case of these unhappy men, who are frequently met with in the forests, has attracted the attention of Government, who have recently taken measures for settling them along the banks of the great rivers, and providing them with the means of obtaining subsistence by fishing.

On the 26th of September we reached the first

post-station, called Baralas. It is 157 wersts from the mountains we had passed, and is, according to our observations, in latitude 65° 51′; we were delighted to find here a good roomy Yourte, prepared for travellers, and kept in excellent order. Near the door we saw pieces of transparent ice, ranged along on clean snow, ready for the soup or the tea-kettle. The interior was well swept, clean hay was laid on the benches round the walls, and a bright fire was blazing on the hearth. The windows were closed by smooth transparent panes of ice, carefully cemented with the same ready material. After being nine days and nights in the open air, in snow and cold, unable to take off our clothes, or to wash ourselves, lest we should be frost-bitten, we thought ourselves in a palace, and a thorough toilette seemed to give us new life. Our worthy host appeared hardly able to appreciate, for want of personal experience, our hearty thanks for so great an enjoyment. He then placed before us a good meal of Siberian delicacies, such as frozen Iakut butter without salt, Struganina, or thin flakes of frozen fish, and lastly, fresh raw rein-deer marrow. We were too well pleased with our host to show any dislike to his entertainment. In the sequel we grew more used to such fare, and I own I now prefer flakes of fresh Struganina, before it thaws, seasoned with salt and pepper, to dressed fish.

On the 27th we left Baralas for the next station, Tabalog, 300 wersts distant. We quitted the ordinary post-road, and took one which the trading caravans follow, and which is nearly 100 wersts shorter. About twenty wersts from Baralas we had to cross the Iana, which is here 140 yards

broad. The ice was as smooth as a mirror, and our horses, not being rough-shod, could not get on, even when their loads were taken off. The guides were obliged to ride back to Baralas, to fetch some sacks of ashes and sand, to strew on the ice, to make it passable.

Along the flat banks of the Iana, and under the shelter of hills, there are many larch and birch-trees on the route we followed; but they are stunted in their growth. The country offers very little variety; on the plain there are many lakes connected with each other by streams of various sizes.

On the 3rd of October we came to the station of Tabalog, which is surrounded by lakes well supplied with fish, and by good pasturages. We also found here a comfortable Yourte, having had no other shelter for the night since we left Baralas, than occasional uninhabited and half-ruined huts. We met here, to my great joy, Dr. Tomaschewski, who was returning (much to his own satisfaction) from a three years' tour of duty at Kolymsk.

We saw to the eastward a range of serrated hills running North and South, having little conical points, which looked like excrescences. These hills form the dividing ridge between the waters of the Iana and the Indigirka. At eighty-five wersts from Tabalog we passed through a valley between these hills. I had no opportunity of ascertaining their composition, but from the numerous fragments of granite, consisting of white feldspar, mica and quartz, which we met with, I conclude they are of that nature. We came afterwards to a large circular valley, still called the Valley of Death, from a tradition that, during the conquest of Siberia, a numerous tribe of rein-deer

Tunguses retreated to this place, where they made a valiant stand against their pursuers, which ended in the whole horde being slain. A singular accident happened to me here; I had quitted the party to gain a better view of the country, and was rejoining it by what I thought a much shorter and straighter path, when, in crossing a frozen stream, the ice in the middle gave way; my horse disappeared, whilst I just managed to spring from his back to the ice, and reached the bank in safety. I thought my horse was drowned, but our native guides, who had seen the accident from a distance, came running to my aid, and laughingly assured me I should find him again, both safe and dry. They immediately went to work to enlarge the opening, and brought the horse out very little the worse for his fall. It often happens, in this country, that after the surface of the stream freezes, almost all the water beneath runs off, leaving an empty space, which in this case was about six or seven feet in depth. Unluckily my saddle-bags broke open in the fall, and I lost my store of tea, sugar and rum; a serious loss to travellers in these regions.

Proceeding on our route, we came to another valley, the sides of which, wherever they were clear from snow, appeared to consist chiefly of slate. At two places, where I was able to observe them correctly, the strike of the strata was from West by North to East by South, and the dip, from North by East to South by West, at an angle of 30° with the horizon. Large fragments of conglomerate, consisting chiefly of slate and granite, were lying in the valley.

We came next to a stream with picturesque banks. The singularly broken forms of the lofty

walls of rock, on either side, resemble the ruined towers and battlements of a feudal castle. We followed this stream until it conducted us to a plain, after crossing which we came to another range of saddle-shaped hills, consisting also of black slate. I was struck by the varied forms of the strata; some were concentric, others diverged obliquely in various directions.*

By following the course of the Gulangina, which winds among the hills, it conducted us to the Indigirka. We saw a number of wild sheep, called here *Argaly* (Capra ammon); they are also to be met with in the Verkhoiansk mountains.

At midnight, on the 10th of October, we reached the little town of Saschiwersk, on the right bank of the Indigirka, 415 wersts from Tabalog. During the journey the cold had never been less than — 4°, and we often had it —22°. We had passed our nights in ruined deserted cottages, and in the Powarnas. The plains were still bare of snow, chiefly from the effect of the constant winds.

In 1786, a short time previous to the expedition of Captain Billings, Saschiversk, which before only consisted of a few huts, was raised to the rank of a district town by the Empress Catherine II. The presence of the authorities gave it a temporary importance; their subsequent withdrawal has allowed it to fall back to its original insignificance. It has still a good church, and four or five cottages inhabited by the priest and his brother, the native overseer of the post-station, and two Russian families. But poor as this place is, it has one feature which renders it well deserving of notice, in the person of the clergyman, who

* I speak only of the foot of the hills, as I could not ascend them.

is known far and wide by the name of Father Michel. At the time of our visit he was eighty-seven years of age, and had passed about sixty years here as deacon and as priest, during which time he has not only baptized 15,000 Iakuts, Tunguses and Iukahirs, but has really made them acquainted with the leading truths of Christianity; and the fruits of his doctrine, his example, and his counsels, are visible in their great moral improvement. Such is the zeal of this truly venerable man for the extension of the Gospel among the inhabitants of these snowy wastes, that neither his great age, nor the severity of the climate, nor the countless other difficulties of the country, prevent his still riding above 2000 wersts a-year, in order to baptize the new-born children of his widely-scattered flock, and to perform the other duties of his sacred calling; as well as to assist his people in every way he can, as minister, as teacher, as friend and adviser, and even as physician. Yet he sometimes finds time and strength to go to the neighbouring hills to shoot Argalis, and other game; and has bestowed so much pains and skill on his little garden, that he has reared cabbages, turnips, and radishes. He placed before us sour krout soup, and fresh-baked rye-bread, and his pleasure in seeing us enjoy these excellent and long-untasted national dishes, was at least as great as our own. He gave us another kind of bread of his own invention. It is made of dried fish grated to a fine powder, in which state it will keep a long time, if not allowed to get damp; mixed with a small quantity of meal, it makes a well-tasted bread.

There is much grass in this neighbourhood, and a number of small lakes well supplied with fish,

particularly with Sigi Schnäpel *(Salmo Cavaretus)* and Tschiri, another species of the same genus. The population consists chiefly of Iakuts, who, during summer, tend their numerous horses and their few cattle in the best pastures, whilst they employ themselves in procuring a store of hay for the winter. When autumn arrives they move to the river, and devote themselves almost entirely to fishing, the chase being quite a subordinate employment. Those who have neither cattle nor horses live entirely by fishing, and make use of dogs and light sledges to draw their fish and their firewood home. On the opposite side of the river, there is a slate rock 150 fathoms high; its horizontal black strata alternate with thicker gray ones, interspersed with selenite; veins of white selenite intersect the whole height of the rock.

The government stores of salt and meal had passed this way to Kolymsk a short time before we arrived, and a hundred horses had been required for their transport; this obliged us to wait two days before we could procure any.

On the 13th we took leave of Father Michel, who gave us, at parting, his blessing, and some little provisions for our journey. The two days which I passed in his hospitable cottage are among the few bright points of remembrance in my journey.

We proceeded across morasses with stunted trees, and occasional pastures and huts, where we could pass the night, until we came to the large lake of Orinkino. Here we entered the Kolymsk district, and from this point to the Alaseia river, a distance of 250 wersts, the country is entirely uninhabited, consisting chiefly of morasses, which are impassable in summer, and which afford no

food either to men or to cattle. These *Badaràny*, as they are called, are never really and thoroughly dry. After a continuance of dry weather in summer, there forms over them a crust, which like thin ice will support a light weight, but gives way with a rather heavier one. The horses of such travellers as are obliged to pass in summer, break in this way through the crust, but do not sink very deep, because they are brought up by the substratum of perpetually frozen earth. There can hardly be any thing more desolate than the appearance of these Badarany, covered only with half-withered moss, and bearing now and then, on rather higher spots, a few miserable larch-bushes, which just creep along the ground. The winter is indeed the only season when these morasses are properly passable; and then, though the ground is hard and safe, the traveller on these vast unsheltered wastes is exposed to the most violent tempests and snow-storms, from which he can only seek refuge in a few widely-scattered and ill-built Powarnas, in which he runs a risk of being suffocated by the smoke which the wind drives in upon him from every side.

We came next to the low range of wooded hills called the Alaseia Range, which separates the waters of the river of that name from those of the Indigirka. In the streams amongst these hills, there is much native iron found. It is of excellent quality. The Iakuts work it into knives, hatchets, &c. Between these hills and the Kolyma, lakes and pasture-ground reappear, and a few solitary inhabited Yourtes are met with, becoming more numerous as the Kolyma is approached.

On the 21st of October, we saw above the

trees, to our great pleasure, the column of reddish smoke which indicated the site of the Sardach station, where we hoped to rest a little from an eight days' laborious journey, without any shelter, and with a temperature from —6° to —22°.

The comfort of the house surpassed our best expectations. There was one room for ourselves, and another for our guides; a bath-room, a store-room, an outer court, long sheds for the protection of the government stores on their way to Kolymsk, a small summer-house, and a sun-dial; stables for horses and cattle at a short distance from the house, and the whole enclosed by a neat palisade fence, running down to a little lake at the foot of the hill, on the opposite side of which there is a thick larch-grove. It is difficult to describe the pleasure afforded by the sight of this little settlement, bearing so many marks of the care and taste of civilized man. I received here the first tidings of M. von Matiuschkin's arrival at Kolymsk, and proceedings there.

From Sardach to Sredne-Kolymsk, the distance is 250 wersts; there are three well-provided post-stations, and the road itself is rendered remarkably agreeable for these regions, by several lakes, thick groves of larch, fine willow-bushes, and generally a more flourishing and varied vegetation. The change is more decidedly marked after passing a little ridge of hills which divides the waters of the Alaseia from those of the Kolyma. It was here that in crossing a lake I first saw a herd of wild rein-deer. They shot almost close by me, pursued by two wolves, who succeeded in pulling down one of them.

It was too dark to distinguish objects when we reached the banks of the Kolyma, on the evening

of the 25th October, but the ascending smoke mingled with sparks, the barking of the dogs, and the occasional glimmering of a lamp through an ice window, told us that we were arriving at Sredne Kolymsk, the church-tower of which we had before seen from a considerable distance. This is the usual residence of the authorities of the district, and possesses a new and well-built church and thirteen houses. In summer most of these are empty, whilst their owners are absent for the chase or fishing, or other employments. When we arrived the scene was particularly animated, as the inhabitants were engaged in constructing a dam across the river, to which they were fastening baskets, &c., to catch the fish in ascending the stream. This fishery was formerly very productive, but the fish have diminished in number so much in the last few years, that the people have been obliged to get rid of most of their dogs, for want of food for them, and to have recourse to horses and cattle. They are giving great care and pains to this object, but the shortness of the summer renders it extremely difficult to provide forage.

The cold was daily increasing; during the latter half of our journey from Sardach to this place, we had had a temperature from —9° to —33°, with a clear sky, but happily without wind. It was necessary for us to stay a day at Sredne Kolymsk to obtain a complete travelling equipment of fur clothing, such as the inhabitants wear, and which will be described in the following chapter.

I was so helpless, when loaded with my new costume, that I was obliged to be lifted on my horse; luckily the skin of the rein-deer combines remarkable lightness with its great thickness and

warmth, or it would be hardly possible to sustain it. The natives do very well under it, and slip in and out through the narrow doors of the cottages, where we novices were constantly sticking.

On the 27th of October we left Sredne Kolymsk, and continued our journey on horseback along the left bank of the Kolyma, meeting occasionally with settlements. After travelling 320 wersts we came to a Russian village on the banks of the river Omolon. Here we changed our mode of travelling, to our great joy; for the intense cold and our cumbrous dresses rendered riding highly inconvenient. We now quitted our horses, and took our places in the light narrow sledges called *Narty*, which are drawn by dogs, and with which we found that we got on much more rapidly than with horses, the surface being smooth, and that we also suffered much less from the cold. Hitherto we had seen woods of larch and of poplar, and had met occasionally with birch and with fine grassy meadows; from this time we scarcely saw any trees, and the bushes became more and more stunted as we proceeded further North. Two days more brought us to Nijnei (Lower) Kolymsk; we arrived there on the 2nd of November, when the temperature was —40°.

We had thus travelled eleven thousand wersts from St. Petersburgh in 224 days, and had reached the first point to which we were bound. We were arrived at Nijnei Kolymsk, a fishing village, destined to be our head quarters for the next three years.

CHAPTER III.

GENERAL REMARKS ON THE DISTRICT OF THE LOWER KOLYMA, AND ON ITS INHABITANTS.

THE River Kolyma has its source in 61½° lat., and 146° long., in the mountains known under the name of Stanowoi-Chrebet, where the Indigirka also rises: its course for the first 1500 wersts follows the direction of the eastern branch of those mountains, or is N.N.E.; it empties itself into the Polar Sea in 69° 40′. For the first 800 wersts, the stream is exceedingly rapid, but the river subsequently becomes wider and more tranquil. The right bank is steep, consisting of bluff rocks, with the exception of the portion between the mouths of the tributary rivers Omolon and Aniui. The rocks are precipitous and often overhanging, composed of slate,* intersected in some places by veins of hardened clay, and chloride slate, as at Cape Kresty: in others the slate is black and pure, without admixture, as at Cape Aspidnoi (Slate Cape): and sometimes, as at the Kandakow rocks, it is interspersed with Amygdaloid Chalcedony, Crystals of Amethyst, and large specimens of Rock-crystal. No fossils have been met with.

* Granite is found at the Baranow rocks, and in the district of Cape Chelagskoi. I observed the first traces of it at Medveji, or Bear Cape.

Notwithstanding the rocky character of the right bank, vegetation is tolerably rich; we saw the beautiful Epilobium latifolium in bloom. A species of Sanguisorba abounds, the roots of which are collected by the natives, and used as an article of food.

The left bank is more flat: in the district of Sredne-Kolymsk there are still high-lying pastures, but in approaching the sea, the bank and the district become gradually lower and flatter, until at last the whole country is one enormous Tundra, or moss-level, extending to the Alaseia and to the sea.

Besides the two rivers Aniui (greater and lesser,) and the Omolon, there are several smaller tributaries: those which have their sources in mountains or rocky districts, are called Kamennye protoki, or rock streams. Those which flow from lakes are called Wiski.

Some wersts above the mouth of the Omolon, an arm of the Kolyma encloses a portion of the western Tundra, forming a low swampy island, on the southern bank of which Nijnei-Kolymsk is situated. The river here has an easterly course for about 100 wersts, after which it turns suddenly to the north: forty wersts below the turn, the streams divides into two branches, forming the island Merchojanow. The greatest breadth of this island is nine and a-half wersts; in length it is continued to the mouth of the river, where it is much intersected by small streams. The eastern arm is called the Kammenaya, or the Stony Kolyma, its breadth is six wersts. The western arm, the Pochodskaia, is not above four wersts wide; it is also called the Srednaia, or Middle Kolyma. About twenty-four wersts fur-

ther to the north, a third less considerable arm called Tschukotskoi, separates itself and flows to the north-west. These three arms form the embouchure, which is about 100 wersts across. The Middle, and the Stony Kolyma, have sufficient depth of water for vessels of all kinds; the navigation is, however, impeded and rendered dangerons by the number of shifting sand-banks formed by the rapid current, especially near the entrance. Besides the two above-mentioned larger islands, there are a number of smaller ones, which are low, and formed in the same manner as the sand-banks.

The severity of the climate of this district may be attributed as much, or perhaps more, to its unfavourable physical position, as to its high latitude. To the west there is the extensive barren Tundra, and to the North a sea covered with perpetual ice; so that the cold N.W. wind, which blows almost without intermission, meets with no impediment: it brings with it violent snow-storms, not only in winter, but frequently in summer. This unsheltered position influences the temperature so greatly, that the average, or mean temperature of the year, is not higher than 14°.

At Nijnei Kolymsk the river freezes early in September. Nearer the mouth, and particularly in the most northerly branch, which has the least rapid current, loaded horses can often cross on the ice as early as the 20th of August, and the icy covering never melts before the beginning of June. It is true that in the course of the three months which are here honoured with the name of summer, the sun remains above the horizon for fifty-two days, but from its nearness to the horizon, the constant light is accompanied by little heat; the disk often assumes an elliptical form, and can

be looked at with the naked eye without inconvenience.

During the season in which the sun does not set, the usual order of nature is still perceptible; when the sun approaches nearest the horizon, evening and night come on, and all is in repose; as the sun gains in altitude nature again awakes; the few little birds hail the new day with their cheerful twittering; the small folded yellow flowers venture to expand their petals, and every thing living appears anxious to partake in the enjoyment which the faint sunbeams afford.

As under the tropics there are only two seasons, spring and summer, so here there are only summer and winter, in spite of the opinion of the inhabitants, who talk quite seriously of a spring and an autumn. They think they recognise a spring in that period when the sun is first visible at noon; though in this vernal season the thermometer is often—35° at night. They reckon autumn, from the first freezing of the rivers in the early part of September.

The vegetation of summer is scarcely more than a struggle for existence. In the latter end of May the stunted willow-bushes put out little wrinkled leaves, and those banks which slope towards the South become clothed with a semi-verdant hue: in June the temperature at noon attains 72°; the flowers show themselves, and the berry-bearing plants blossom, when sometimes an icy blast from the sea turns the verdure yellow, and destroys the bloom. The air is clearest in July, and the temperature is usually mild. But, as if to embitter to the inhabitants of this dreary region this semblance of summer, and to cause them to wish for winter again, millions of musquitoes darken the

air, and oblige every one to take refuge in the thick and pungent smoke of the dymokuries,* which affords protection from these tormentors. But as every thing in nature has a beneficent purpose, and all disadvantages are compensated by some good, these insects render an essential service to the inhabitants, by forcing the rein-deer to leave the forests, and to take refuge in the cold open plains near the sea. This they commonly do in troops of many hundreds, or even thousands; the hunters then lie in wait for them, especially as they cross the rivers and lakes, and kill numbers without difficulty.

The musquitos render also another service in preventing the horses from straying away in the vast plains, where they feed without keepers. Their natural instinct teaches them to keep near the dymokuries, which protect them from their enemies. One sees them grazing on the lee-side of these glimmering heaps, in the cover of the smoke. When the pasture is fed off, the smoke-heaps are established in a fresh place. They are generally enclosed by a slight fence, to prevent the horses from coming too near the fire.

In summer the rolling of thunder-storms can be heard in the mountains, but they have little influence on the great plains.

Winter, properly so called, prevails during nine months of the year. In October the cold is somewhat mitigated by thick fogs, and by the vapour rising from the freezing sea; but in November

* These dymokuries are large heaps of fallen leaves, moss, and damp wood; the thick smoke which comes from them drives away the musquitoes; they are placed both in the pastures and near the houses, so that the inhabitants pass the whole musquito season in a constant cloud of thick and pungent smoke.

the great cold begins, and in January encreases to —65°. Then breathing becomes difficult; the wild rein-deer, that citizen of the Polar region, withdraws to the deepest thicket of the forest, and stands there motionless, as if deprived of life. The night of fifty-two revolutions of the earth is relieved by the strong refraction, and by the whitened surface of the snow, as well as by frequent auroras. On the 28th of December a pale twilight begins to be visible at noon, but is not sufficient to dim the stars. As the sun returns, the cold becomes even more sensible, and the intensity of frost, which accompanies the rising of the sun in February and March, is especially penetrating. Perfectly clear days are extremely rare in winter, because the sea-winds, which always prevail, bring with them continual vapours and fogs, which are sometimes so intense as wholly to conceal the stars of the deep blue polar sky. These thick fogs are called Morrok. They prevail least in September.

There is a remarkable phenomenon known here by the name of Teploi Weter (the warm wind), blowing from the S.E. by S.; it sometimes begins suddenly, when the sky is quite clear, and in the middle of winter raises the temperature, in a short time, from —47° to + 35°; so that the plates of ice, which are the substitute for glass in the windows, begin to melt. In the valleys of the Aniui, the warm wind is frequently felt; its influence does not extend to the west of Cape Tchukotski. It is seldom of longer continuance than twenty-four hours.

Though, from all that has been said, the climate is one of the most severe and unkindly, yet it must be owned that it is not, on the whole, pre-

judicial to health. There are here neither scurvy, nor other dangerous infectious diseases. Catarrhal fever, and complaints of the eyes are prevalent, but only in October, during the thick fogs; and in December, when the severe frosts set in. The inflammation of the eyes is partly caused by reflection from the snow, which is so powerful as to require a protector to be worn. The sickness, called Powetrie, which prevails amongst the inhabitants of the coast to the west of the Kolyma, is much more rare and less malignant in this district. The disease which, in 1821, attacked the dogs throughout Northern Siberia, did not make its appearance at Kolymsk till a year later than on the rivers to the west and along the Tchuktche Coast. There is here indeed, as in all Northern Siberia, that singular malady called Mirak; which, according to the universal superstition of the people, proceeds from the ghost of a much dreaded sorceress, which is supposed to enter into and torment the patient. The Mirak appears to me to be only an extreme degree of hysteria; the persons attacked are chiefly women.

The scanty vegetation corresponds to the severity of the climate; the neighbourhood of Nijnei Kolymsk is especially poor in this respect. It is a low marsh, on the surface of which a thin layer of vegetable earth is intermingled with ice which never thaws; it supports a few stunted larches, whose roots, unable to penetrate into the frozen soil, extend along its surface, and derive nourishment only by the smaller fibres, which alone are completely covered. A few small-leaved willows grow on the banks facing the south. On the plains a hard reedy grass furnishes a food for cattle, which is better in quality in those parts

which are occasionally overflowed by sea-water. The nearer we approach the sea, the more rare become the bushes; on the left bank of the Kolyma they cease entirely about thirty-five wersts north of Nijnei Kolymsk; on the right bank of the river they extend further to the north; the drier soil is more favourable to vegetation, and produces stronger plants, as well as a greater variety, than does the dreary icy moor on the other side. On the right bank there are patches of good grass, of wild-thyme, and of wormwood; and even the wild-rose and the forget-me-not are to be found. The currant, the black and the white whortleberry, the cloudberry, and the aromatic dwarf crimson bramble *(Rubus arcticus)* bloom here, and in favourable seasons bear fruit. No one attempts the cultivation of any vegetable, nor could success be expected. At Sredne Kolymsk, which is 2° further South, I have seen radishes, and even cabbages, but the latter formed no heads.

In the valleys of the Aniui, which are sheltered by mountains from the prevailing cold winds, birches, poplars, willows, and the low-creeping-cedar grow. In comparison with the frozen naked moss-tundra, one thinks oneself transported to Italy; but in these valleys also, the snow appears to melt only to form fresh ice beneath the thin covering of mould which the sun never penetrates.

The poverty of vegetation is strongly contrasted with the rich abundance of animal life. Countless herds of rein-deer, elks, black bears, foxes, sables, and grey squirrels, fill the upland forests; stone foxes and wolves roam over the low grounds. Enormous flights of swans, geese, and ducks arrive in spring, and seek deserts where they may

moult and build their nests in safety. Eagles, owls, and gulls pursue their prey along the sea-coast; ptarmigan run in troops amongst the bushes; little snipes are busy along the brooks, and in the morasses; the social crows seek the neighbourhood of men's habitations; and, when the sun shines in spring, one may even sometimes hear the cheerful note of the finch, and in autumn that of the thrush.*

Yet all this manifold life cannot alleviate the dreariness of the desert, or repress the thought, that here is the limit of the animated world. The animals either visit or inhabit these icy deserts in obedience to the unerring laws of instinct; they have no choice to exercise. But what induced man to fix himself in this dreary region? I speak not of the few Russians, whose stay for a limited period is determined by the hope of gain, but of the tribes who came here without such motive, and who now dwell in these countries. Nomade races, under milder skies, wander from one fruitful region to another, gradually forget the land of their birth, and prefer a new home. But here there is nothing to invite. Endless snows and ice-covered rocks bound the horizon. Nature lies shrouded in almost perpetual winter. Life is a continual conflict with privation, and with the terrors of cold and hunger. What led men to forsake more favoured lands

* According to the observations of Dr. Kyber, the only birds which winter here are the ptarmigan, the common crow, the bald eagle, and the snowy-owl. The snow-bunting and the Kamtschatkan thrush (*Motacilla calliope*), appear early in April. The lap-wing, common snipe, and ring-plover arrive later; and in May, swans, four kinds of geese, and eleven kinds of ducks, make their appearance.

for this grave of nature, which contains only the bones of an earlier world? It is in vain to ask the question of the inhabitants, who are incessantly occupied with the necessities of the present hour, and amongst whom no traditions preserve the memory of the past. Nothing definite is known concerning the inhabitants, even at the not very remote epoch of the conquest of Siberia by the Russians. I have indeed heard an obscure saying, "that there were once more hearths of the Omoki on the shores of the Kolyma, than there are stars in the clear sky;" there are also remains of forts formed of trunks of trees, and tumuli; the latter especially near the Indigirka; both may be supposed to have belonged to these Omoki, who have now disappeared.

From the little I could gather on the subject, it would seem that the Omoki were a numerous and powerful people; that they were not nomades, but lived in settlements along the rivers, and supported themselves by fishing and hunting. Another numerous tribe, the Tchukotschi, or Tchuktches, appear to have wandered over the Tundra with their herds of rein-deer; they have left their names to features of the country; as for example, the Malaja and Bolschaja Tchukotskia, the greater and the lesser Tchuktche rivers. Both races have disappeared; the Omoki have probably perished by want and sickness, and the Tchuktches have partly wandered towards the north-east where they are still to be found, and partly become confounded amongst new arrivals, forming with them the present scanty population of the country. In the whole Kolyma circle there are now 325 Russian peasants citizens and Cossacks, 1034 Iakuts, 1139 Iukahirs and other races; in all 2498 males, of whom 2173 pay Iassak.

The Iassak, or tribute, consists of 803 foxes and 28 sables (which may be estimated at 6704 roubles), and 10,847 roubles in money, making on an average about eight roubles to be paid by every male of the Iakuts and other tribes. The peasants and citizens are chiefly descended from exiles; and the Cossacks from those of that race who came here from the fortress on the Anadyr, when it was destroyed by the Tchuktches. Up to the year 1812 the Cossacks were reckoned as belonging to the public service, and received from government a certain provision, which however they were bound to fetch themselves from the upper district of the Kolyma. With the usual carelessness of this people for the future, they were induced, by a few successive good hunting and fishing years, to neglect this somewhat troublesome transport; and in the year 1812 the provision ceased to be issued. Several years have since taken place, in which the fishing and hunting have been less productive; general want has frequently prevailed, when they have had occasion to rue the loss of the advantages they formerly possessed. With the exception of six Cossacks who are in public employ, the remainder form a corporation, governed by a principal, and under the commissioner at Sredne Kolymsk; they pay no tribute, but are bound to appear when called on, provided with sabres and fire-arms. They also furnish a party of twenty-five or thirty to attend at the yearly Tchuktche fair, to keep order, and to protect the Russian and other traders, if required, against Tchuktches.

Although the Russians in this district have approximated to the other inhabitants in clothing and modes of life, and even in features, they are still easily distinguishable by their more muscular

frame. They are generally taller, fairer in complexion, and many amongst them have light brown hair, which is never seen amongst the native races. The Russian women also, in spite of the heavy labour they undergo, and their want of cleanliness, have more agreeable features than the natives, and many amongst them might even be called pretty. I was particularly impressed by their general kindness, and their affectionate demeanour towards their husbands and children. I had often occasion to witness the return of the husband or the son from a dangerous chase or a distant journey, and the heartfelt joy of the meeting. Most of the Russian women sing very agreeably songs of their own composing, of which the subjects are frequently regrets at the absence of those who are dear to them. It is curious to remark in their songs, the reminiscences of earlier times, in the allusions to doves, nightingales, flowers, and many other objects not to be met with in a distance of many thousand wersts, and which the songstress knows only by tradition.

The dwellings of the two races are much alike. The larch trees are too small to be of use in the construction of their habitations, for which they are obliged to employ drift wood. This is carefully collected at the floods in spring, and it sometimes takes several years to accumulate the necessary timber for a house. The walls are formed in the Russian manner, the interstices being filled up with moss, and plastered with lime: a thick mound of earth is thrown up against them, reaching as high as the windows, and forming a protection against the cold. The huts are usually from twelve to eighteen feet square, and nine feet high. The roofs are flat, and covered

with a considerable thickness of earth. The interior arrangement is always the same: in one corner of the room is the Iakut Tchuwal, a kind of open fire-place made of willow-rods plaistered on both sides with a thick coat of clay; the smoke escapes by the roof. They have lately begun to make Russian stoves of hard-beaten plaister, with a chimney up to the roof. Two or three sleeping-places are partitioned off, according to the wants of the family; and the remainder of the space serves for cooking, dwelling, working, and receiving guests. Wide benches are arranged around, on which rein-deer skins are laid for guests to sit and to sleep on. Household utensils, guns, bows and arrows, &c., hang round the walls. Two little windows of a foot square, or less, might give sufficient light, if they had glass panes; but in summer they are made of fish-membrane, and in winter of plates of ice six inches in thickness. On one side of the house is a small porch, and adjoining to it is the provision-room, made of thin boards. There is sometimes a second fire-place in the porch. All the houses have the windows turned to the south. Both near the house and on the roof are scaffolds for drying fish; and there is a small out-house for sheltering the dogs in extreme cold weather; but they are more generally tethered outside, and bury themselves in the snow. Enclosed courts are hardly ever seen. The houses are not arranged in streets, but by accident, or at the caprice of the builder; the people do not care for baths, and those which the Government has constructed in every village are neglected, and are generally in decay.

Generally speaking, there is but little cleanliness. Linen is only met with among a few rich

persons, who have under garments of linen or cotton cloth. Those in general use are made of soft rein-deer skins sewed together, and are worn with the hair inside. The outside is coloured red with the bark of the alder, and the edges and sleeves are trimmed with narrow strips of beaver or river otter-skin, which they buy at rather high prices from the Tchuktches; the trowsers are of rein-deer skin. Over the fur shirt an upper garment, called Kamleia, is worn. It is made of thick-tanned rein-deer leather without hair, and is coloured yellow by smoke: it is closed before and behind, and a hood fastened to the back of the neck, is drawn over the head on leaving the room. People of fortune have a garment of the same form for wearing in the house, made of a cotton cloth called Kitaika. The feet are covered with brown leather or black goat-skin, sewed to tops of rein-deer skin with the hair on; the leather is ornamented with various devices in silk, and sometimes even embroidered with gold thread; two long bands are crossed round the legs, and bind the boots and trowsers together. In the open air they wear a double fur-cap, narrowing at the top, but deep and broad enough to cover the forehead and the cheeks: they wear besides little separate coverings for the forehead, ears, nose, and chin; these are often articles of great cost; the forehead band especially, which being worn more for ornament than use, is adorned with all kinds of coloured and gold embroidery. When the cap is laid aside on going into a room, the forehead band is often kept on for show.

On journeys the Kuchlanka is worn over all the above-mentioned garments. It is a wider Kamleia made of double skin, and with a thick large

hood; hand-bags are sewn to the sleeves: a small opening is left on the inside, through which the hand can be drawn when required for use, and can be immediately slipped back again into protection from the cold. Instead of the house-boots, half-stockings of the skin of the young rein-deer are worn, and the Torbassy, or boots, are drawn over these. In this costume one can defy the cold for a long time.

The belt carries a large knife, the Gansa a very small tobacco-pipe made of brass or tin with a short wooden tube, a pouch containing the materials for striking a light, and the tobacco, which is mixed with finely powdered larch-wood, to make it go further.

The Russians here smoke in the manner common to all the people of Northern Asia; they draw in the tobacco smoke, swallow it, and allow it to escape again by the nose and ears. They speak much of the pleasurable sensation of the sort of intoxication thus produced, and maintain that this manner of smoking affords much warmth in intensely cold weather.

The house-clothing of the women differs from that of the men, chiefly by being made of much lighter skins; rich women use cotton, or sometimes even silk stuffs, and ornament the part about the throat with trimmings of sable or martin. They generally bind cotton or silk handkerchiefs round their heads, and sometimes wear besides knitted night-caps, under which the married women conceal their hair, after the Russian fashion. The young girls allow theirs to hang down in a long braid, and wear a forehead band when they are more dressed than usual. Their gala dress resembles a good deal that which was

worn some twenty years since, by women of the trading classes in Russia. The larger the flowers, and the more various the colours of the silk, and the heavier and gayer the ear-rings, the more handsome and tasteful the full-dress is considered. The traders who come to the yearly fairs know how to make their advantage of this; they bring the finery which is gone out of fashion even at Iakutsk, to the banks of the Kolyma, and sell it for high prices, as the newest mode.

To have a good idea of the customs and peculiar mode of living of the inhabitant of the banks of the Kolyma, one must have really lived with him for some time; one must have gone with him from his winter dwelling to his summer Balagan, have navigated the rapid rivers with him in his Karbass or heavy boat, or in his Wetka or light boat. One must have climbed the rocks and the hills with him, on foot or on horse-back; have threaded with him the mazes of the thick forest; and have coursed with him over the boundless Tundra, on the light sledge, drawn by swift dogs, in the most intense cold, and in violent snow-storms. In a word, one must have become one of the people. Such was our life during nearly three years. We lived amongst them, we dressed as they did, we fed like them on dry fish, and shared with them all the privations and the discomforts inseparable from the climate, and from the frequently heavily pressing scarcity of all the necessaries of life. I am therefore enabled to give a faithful picture of life in Nijnei Kolymsk, which, apart from a few local circumstances, will apply to the whole course of the Kolyma.

Let us begin with spring. The fisheries are, as we have before remarked, the most important of

all the branches of industry of the inhabitants, and indeed that on which their very existence essentially depends. The locality of Nijnei Kolymsk is so unfavourable for it, that in spring the people leave their habitations, and scatter themselves along the banks of the river in search of places which appear advantageous, where they erect a Balagan or light summer-hut, and make their fishing arrangements. Most of the citizens have little settlements, or country-houses of this kind, at the mouths of the smaller streams, and begin to visit them in April, to make their preparations. In the middle of May, when the traders are passing the lesser Aniui, on their return to Iakutsk, from the yearly fair at Ostrownoie, the whole population of the place goes to meet them; and there are left only the Cossack commander, one or two guardians, the priest, and perhaps a few hungry families, who have nothing to sell, and who are too weak to follow the crowd.

Spring is on the Kolyma the severest season of the year; the provisions which were laid up in summer and autumn have been consumed in the long winter; the fish, which had withdrawn into the deepest parts of the rivers and lakes, during the intense cold, have not yet re-appeared. The dogs are often too much exhausted by the winter work, and insufficient food, to be fit for chasing the rein-deer and elk over the Nast,* the last

* When the warmth of the sun in spring thaws the surface of the snow, it freezes again at night, and forms a thin crust of ice, which is just strong enough to bear a light sledge with its team of dogs. This state of the snow is called Nast. The hunters profit by it to pursue the elks and rein-deer by night; and as the weight of these animals causes them to break through, they fall an easy prey. The Nast continues to form during a longer or shorter period, according to the more or less sheltered local-

favourable opportunity which the early spring affords. A few ptarmigan are snared, but they are quite insufficient to satisfy the general want. Tunguses and Iukahirs come in parties from the Tundra, and from the Aniui, to the Russian villages on the Kolyma, to escape starvation. One sees them, like wandering phantoms, pale, without strength, scarcely able to walk; they throw themselves greedily on any remains of bones, skin, or aught else which may in any way alleviate the pangs of hunger; but there is little comfort for them in the villages, where want reigns likewise; the inhabitants are obliged to have recourse to the small remains of the provisions designed for their dogs, many of which are often starved in consequence.

It is true a magazine is established by the government for the sale of rye-meal; of course this is without gain, and, on the contrary, at some sacrifice; but still the enormous distance, and the difficulties of the transport, which sometimes requires two years, raise the cost of the meal to a price which the greater number cannot command; although, in order to bring it more within their reach, purchasers are allowed to defer payment until the autumn or winter. But there are very few who are able to give twenty roubles for a pood of meal, which, moreover, is sometimes half spoilt by the long journey. Whilst we were at Sredne Kolymsk, the commissioner was desired to give in an estimate of the quantity of meal which ought to be sent for the use of his district; he applied to the Golowa of the Cossacks, who

ity, and according to the thickness of the snow. It is not formed every year. During the whole time of our stay, there was no Nast in the district.

is particularly charged with the superintendence of the Tunguses and Iukahirs; the reply of the latter functionary was, "I do not know how to furnish you with such a definite estimate as you require, but this much I can assure you, that there are not many here who would be able, or who would even be disposed, to pay two roubles a day, to prolong their miserable life."

I have lived here through three such dreadful springs. I cannot even now look back without shuddering to the scenes of misery which I have witnessed, but which I may not venture to describe.

But usually, when need is at the highest, help appears. Suddenly large flights of birds arrive from the South; swans, geese, ducks, and snipes of different kinds. The general distress is now at an end. Old and young, men and women, all who can use a gun or a bow, hasten to the pursuit. Fish too begin by degrees to be taken in nets and baskets placed under the ice. The terrible time of hunger is ended for the present. At first the food is not very abundant, and the half-starved people are accustomed to it by degrees, just as an experienced physician would treat his patients. At last, in June, the rivers open and fish pour in in abundance; all hands are in activity to profit by this short harvest, in order to lay up provisions for the following year. But sometimes this season brings with it a new difficulty. The rivers cannot carry away sufficiently fast the masses of ice which are borne down by the current; these ground in bays or in shallows, and thus form a kind of dam, which impedes the course of the river, and causes it to overflow the banks: in this way the meadows and

villages are sometimes laid under water; and those who have not driven their horses to higher ground in sufficient time, lose them. In the summer of 1822 we had an inundation of this kind. It was so sudden, that we had but just time to remove our things to the flat roof of the house, where we passed more than a week. The lake to the north of Kolymsk united its waters with those of the river, and the whole village looked like an archipelago of little islands, (the roofs of the houses,) amongst which the people went about in their boats, visiting each other and fishing. These overflowings of the rivers take place more or less every year.

When the waters subside, the great net-fishing begins. In spring the fish come down the stream in great numbers. In some places this lasts only a few days; in others, as at Pochodsk, and at the Tchukotski River, it continues throughout the summer, though gradually lessening in quantity. This is the time when sturgeon, a large kind of salmon-trout (*Nelma,*) a large fish with bowed backs (*Muksun,*) and a species called *Tschir,* are taken. The fish caught in coming down stream are generally very thin, for which reason they are usually put aside for the dogs, and are prepared as Iuchala, i. e. cleaned, cut open and laid flat, and dried in the air. The entrails are boiled down into a kind of train oil, which is often used in cooking as well as for the lamps.

Strong gales from the sea sometimes agitate the water in the river, so as to hinder the putting down the nets at the time when the greatest number of fish are passing. Partly for want of skill, and partly for want of a sufficient quantity of nets, which are here generally made of horse-hair, the fishermen do not venture to place them

in the mid current, where the fish are both most numerous and of largest size. The same reasons induce them to confine themselves in great measure to the tributary streams. During the floods great numbers of fish are driven into these smaller rivers and the lakes connected with them; when the waters subside they come down again, and the people take them in quantities by means of weirs, baskets, &c.; all hands engage in these smaller fisheries, which are made in some degree in common, the produce being divided in proportions amongst the owners of the baskets, whereas in the net fishery, the nets are let down in succession, according to an established order, and each cast belongs to the master of the net.

It is chiefly in the smaller rivers that they take the fat Tschiri, which are a favourite delicacy, and are prepared as Iedomnaja Iukola. These differ from the Iuchala spoken of above, by being made only of the very best fish, and are prepared with great care. The fish is split in half, the entrails are taken out, and in order that the flesh may be more tender and better dried, it is scored: sometimes they are smoked instead of being dried. The upper part of the backs are usually cut off, dried separately, and pounded in a wooden mortar: they are then mixed with train oil, and preserved for the winter in wooden vessels with narrow mouths. In like manner the underpart, which contains most fat, is preserved separately, as it furnishes a favourite addition to the cakes, which are not made of meal, but of the soft parts of fresh fish, cut small and baked.

When these fisheries are over, large fish are beginning to go up the rivers from the sea. They are taken both with nets and baskets.

Whilst all these different fisheries are going on,

the swans, geese, and ducks are moulting, and bringing out their young broods on the lakes. As soon as they arrive, some of the fishermen are detached to watch the nests. At first they take some of the eggs, which are replaced by new-laid ones. The chase does not begin until the birds are moulting and unable to fly. A great number of the fishermen then leave the rivers and go to the breeding-places of the wildfowl. They employ trained dogs to pursue them, and kill great numbers with guns, arrows, and sticks. Part are smoked, and the greater number are frozen hard and preserved in snow against the winter. This chase is much less productive than formerly; twenty years ago several thousand geese were sometimes killed in a day. Now it is called a good season when 1000 geese, 5000 ducks, and 200 swans are killed at the mouth of the Kolyma.* However, this does not arise from any real decrease in the wildfowl; but the people being engaged in the fishery, which is less troublesome and ordinarily more certain in its returns, are apt to delay the chase till there is very little time left for it.

Besides the stores of fish and fowl, good housekeepers provide themselves with rein-deer meat. When the rein-deer are in motion in large troops in the summer, some hunters go up the Aniui in boats, and others proceed on horseback to the shores of the large lakes in the Tundra. The deer are driven into the water by trained dogs, and are then killed with spears as they are swimming. A skilful hunter may kill a hundred deer

* It seems to be clearly ascertained that birds of passage do not always visit the same spot two years successively, but that they frequently change their breeding-places.

on the Aniui in good years, whereas, on the Tundra he would never get more than twenty, and sometimes not more than five; but on the other hand the chase on the Aniui is often a complete failure, which is never the case on the Tundra; moreover, the deer which are killed on the latter, are generally larger and better fed than the others.

Whilst the men are engaged in fishing and hunting, the women avail themselves of the short summer to collect what little the vegetable kingdom can furnish for the winter provision. I have before said that the partially thawed soil supports different kinds of berries, and a few edible roots and aromatic herbs, particularly in the mountains. The women are thoroughly acquainted with them all, and collect as many as the more or less favourable summer may permit. It is not indeed every year that these poor remnants of vegetation survive to maturity. In the years 1821, 22, and 23, the berries failed so completely that none of these forest fruits were to be met with. Most of them, particularly the bilberries, grow on the east side of the Kolyma, and on the declivity of the Panteljiva mountains; they are gathered in the middle of August. The berry-gathering here, like the vintage elsewhere, is a time of merriment. The younger women and girls go together in large parties, often pass whole days and nights out, enjoying the open air, and interspersing their work with various amusements. When the berries are collected, cold water is poured over them, and they are preserved in a frozen state for a winter treat.

The only plants and roots made use of are the Makarscha and wild thyme; the latter is used both for smoking articles of food, and as a con-

diment. The Makarscha is a farinaceous root, which is used partly as an addition to the meat or fish cakes, to which it gives an agreeable flavour, and partly alone, as a kind of dessert before supper. The field-mice lay up in their holes large stores of this and of other roots. The women are particularly expert in discovering these deposits.

In September the shoals of herrings begin to ascend the rivers,* and almost all the population hasten to the most favourable spots for catching them. The multitudes of these fish are often so enormous, that in favourable years 3000 or more may be taken at a draught, and in three or four days 40,000 head may be taken with a single good net. It happens sometimes, that when during the three preceding months, in spite of all efforts, the other fisheries have given hardly any thing, a good herring season comes, and the store-houses are filled in a few days. The herrings are hung up on the scaffolds before the frost begins, that the water which is in them may drain off before they freeze. This makes them much lighter for carrying on journeys; those which are collected during a frost become immediately covered with a thin crust of ice, which spoils their flavour.

About the time of the herring fishery the reindeer hunters return from the Aniui and from the Tundra: this is a period of great animation and interest. If the chase has been successful, universal joy prevails; it forms for a long time the only subject of every conversation. The minutest cir-

* The largest herrings are found in the Kolyma; those in the Alaseia are smaller, and those in the Iana and Indigirka are still less. Hence it would appear that the shoals of these fish move from the west towards the east.

cumstances, every motion of the pursued rein-deer, the proofs of skill of the hunter, and of the dogs, &c., are narrated with as great exactness, and in as much detail, as if it were question of the movements of hostile armies.

When the frosts begin, the summer fisheries are at an end, and the autumn fishing commences. As soon as the rivers freeze, horse-hair nets are set, by cutting holes in the ice across the stream, and sinking the net below. Muksuny, Omuly (*Salmo autumnalis*,) and Nelma, (*Salmo nelma*,) are taken in this way. This kind of fishing is most productive near the sea; it is continued with more or less success till the beginning of December, when the darkness and the intense cold oblige the fishermen to give up their labours, and return to their homes.

Besides the hunting and fishing there are other matters which cannot well be neglected. Those who possess horses must endeavour to make some little provision of hay for them; sometimes the house must be repaired, or a new one built. Snares must be set in the forest for the fur animals,* and must be visited from time to time:

* These traps, called *Past*, are a kind of long box in which the bait is connected with the open lid, in such manner that at the slightest touch the latter closes and keeps the animal shut up till the hunter comes. The Russian inhabitants of Nijnei Kolymsk have above 7,500 such traps, along the banks of the river, on the eastern side, and in the western Tundra. Sables and foxes are chiefly taken on the eastern shore of the Kolyma, and along the mountain rivers Philippowka, Panteljiva, &c. and stone-foxes on the western Tundra. The wolverine is seldom taken, as he is strong enough to break through the trap, if caught. A careful hunter visits his traps at least ten times in a winter, but few do it so often, and nearly half the animals which are caught are lost in consequence. The hunters reckon upon about one take for every ten traps, every time they visit them. A very injurious custom prevails among the Tunguses and Iukahirs, of carrying

this is usually done on horseback before the first snow falls, when the ground is hard frozen. After snow has fallen, sledges and dogs are used. About this time the rein-deer leave the western side of the river, and cross to the eastern, and the inhabitants employ a variety of devices for taking them in the passage. Parties also go with sledges to hunt the elk and the wild sheep on the Baranow rocks; and other parties go in chase of foxes, sables, and squirrels, by pursuing their traces in the fresh fallen snow, in sledges drawn by trained dogs. The latter chase is especially followed by the Iukahirs of the Aniui and the Omolon, who live in the mountains and forests, and by the Iakuts of Sredne and Verkni-Kolymsk.

On the Tundra, along the sea-shore, long rows of traps, similar to those above described, are set for the wandering stone-foxes, which are very abundant, but their skins are of inferior value. They are particularly numerous once every three years, but when there are also many mice, the stone-foxes are less tempted by the bait, which is either a small living animal, or a piece of poisoned meat. Skill in setting the traps is highly esteemed, and the names of the best fur-hunters are known far and wide. But those who are successful in chasing the elk and the bear, and who do not shun a conflict, if necessary, with these animals, are held in still higher esteem. Stories of the adroitness, the courage, or the strength shown in these encounters, are the favourite subjects of conversation, and, apart from exaggerations, some of these stories are really

away the young whenever they find them, even when still blind. The number of young foxes destroyed in this way is very considerable.

extraordinary. I will relate one instance which occurred during my stay in the country: two hunters, father and son, had gone out on horseback to hunt foxes; they had had very poor sport, and were returning almost empty handed, when by accident they came upon a bear, in his den. Though unprovided with the proper weapons for attacking him, they determined to attempt it. The father placed himself at the one entrance of the den, and stopped it with his broad shoulders; the son, armed only with a light spear, attacked the bear at the other opening; more tormented than injured by the weapon, the animal sought to get away by the first opening, but neither his claws nor his teeth could pierce the thick, smooth, well-stretched double fur jacket of the broad-shouldered Iukahir, who kept his post till his son had succeeded in killing the bear.

Such rash enterprises are not always successful; a Russian, descending the Kolyma in a boat, alone, saw a very fine elk swimming across the river. Unwilling to let so favourable an opportunity escape, although the boat was much too small to have carried the animal had it been killed, he prepared a noose, and threw it over the horns of the elk; he then rowed vigorously for the shore, and, whilst the water continued deep, the elk suffered itself to be drawn; but as soon as it felt the ground under its feet, it rapidly gained the bank, and made off at all speed for the neighbouring forest, dragging along the light boat, and the unfortunate Russian, who was some time before he could disengage himself. Endless stories of this kind are told, with the minutest circumstances, and occasionally with embellishments.

Of all the animals that live in the high north latitudes, none are so deserving of being noticed as the dog. The companion of man in all climates, from the islands of the South Sea where he feeds on bananas, to the Polar Sea where his food is fish, he here plays a part to which he is unaccustomed in more favoured regions. Necessity has taught the inhabitants of the northern countries to employ these comparatively weak animals in draught. On all the coasts of the Polar Sea, from the Obi to Behring's Straits, in Greenland, Kamtschatka, and in the Kurile Islands, the dogs are made to draw sledges loaded with persons and with goods, and for considerable journeys.

The dogs have much resemblance to the wolf. They have long, pointed, projecting noses, sharp and upright ears, and a long bushy tail; some have smooth and some have curly hair; their colour is various, black, brown, reddish-brown, white and spotted. They vary also in size; but it is considered that a good sledge-dog should not be less than two feet seven and a-half inches in height, and three feet three quarters of an inch in length (English measure).

Their barking is like the howling of a wolf. They pass their whole life in the open air; in summer they dig holes in the ground for coolness, or lie in the water to avoid the musquitos: in winter they protect themselves by burrowing in the snow, and lie curled up, with their noses covered by their bushy tails. The female puppies are drowned, except enough to preserve the breed, the males alone being used in draught. Those born in winter enter on their training the following autumn, but are not used in long journeys

until the third year. The feeding and training is a particular art, and much skill is required in driving and guiding them. The best trained dogs are used as leaders, and as the quick and steady going of the team, usually of twelve dogs, and the safety of the traveller, depend on the sagacity and docility of the leader, no pains are spared in their education; so that they may always obey their master's voice, and not be tempted from their course when they come on the scent of game. This last is a point of great difficulty; sometimes the whole team, in such cases, will start off, and no endeavours on the part of the driver can stop them. On such occasions we have sometimes had to admire the cleverness with which the well-trained leader endeavours to turn the other dogs from their pursuit; if other devices fail, he will suddenly wheel round, and by barking, as if he had come on a new scent, try to induce the other dogs to follow him. In travelling across the wide tundra, in dark nights, or when the vast plain is veiled in impenetrable mist, or in storms or snow-tempests, when the traveller is in danger of missing the sheltering powarna, and of perishing in the snow, he will frequently owe his safety to a good leader; if the animal has ever been in this plain, and has stopped with his master at the powarna, he will be sure to bring the sledge to the place where the hut lies deeply buried in the snow; when arrived at it he will suddenly stop, and indicate, significantly, the spot where his master must dig.

Nor are the dogs without their use in summer; they tow the boats up the rivers, and it is curious to observe how instantly they obey their master's voice, either in halting or in changing the bank

of the river. On hearing his call they plunge into the water, draw the towing-line after them, and swim after the boat to the opposite shore; and, on reaching it, replace themseves in order, and wait the command to go on. Sometimes even, those who have no horses will use the dogs in fowling excursions, to draw their light boats from one lake or river to another. In short, the dog is fully as useful and indispensable a domestic animal to the settled inhabitant of this country, as the tame rein-deer is to the nomade tribes. They regard it as such.* We saw a remarkable instance of this during the terrible sickness, which, in the year 1821, carried off the greater part of these useful animals. An unfortunate Iukahir family had only two dogs left out of twenty, and these were just born, and indeed still blind. The mother being dead, the wife of the Iukahir determined on nursing the two puppies with her own child, rather than lose the last remains of their former wealth. She did so, and was rewarded for it, for her two nurselings lived, and became the parents of a new and vigorous race of dogs.

In the year 1822, when most of the inhabitants had lost their dogs by the sickness, they were in a most melancholy condition; they had to draw

* It was once unwisely proposed to forbid the keeping of dogs on account of the quantity of fish required for their support, which is thus withdrawn from the food of the inhabitants. Each sledge, of twelve dogs, requires daily from fifty to seventy herrings. But if this measure had been adopted, so far from increasing the quantity of food at the command of the inhabitants, it would have deprived them of one of their chief means of procuring subsistence, as was most clearly proved at the time of the great mortality amongst the dogs in 1821 and 1823. This highly injudicious proposal was happily rejected by the government.

home their own fuel; and both time and strength failed them in bringing home the fish which had been caught in distant places; moreover, whilst thus occupied, the season passed for fowling and fur-hunting; and a general and severe famine, in which numbers perished, was the consequence. Horses cannot be made a substitute: the severity of the climate, and the shortness of the summer, make it impossible to provide sufficient fodder; the light dog can also move quickly over the deep snow, in which the heavy horse would sink.

Having thus described the out-of-door life and employments of the people of this district, let us accompany an individual into his habitation at the close of summer, when he and his family rest from all these laborious efforts, and enjoy life after their manner. The walls are caulked afresh with moss, and new plastered with clay, and a solid mound of earth is heaped up on the outside as high as the windows. This is accomplished before December, when the long winter nights assemble the members of the family around the hearth. The light of the fire, and that of one or more train-oil lamps, are seen through the ice-windows; and from the low chimneys rise high columns of red smoke, with magnificent jets of sparks, occasioned by the resinous nature of the wood. The dogs are outside, either on or burrowed in the snow. From time to time their howling interrupts the general silence; it is so loud as to be heard at great distances, and is repeated at intervals, usually of six or eight hours, except when the moon shines, when it is much more frequent.

A low door, over which hangs the thick skin of a white bear, or of a rein-deer, leads into the dwelling room. There the father and his sons are

seen making nets of horse-hair, and preparing bows, arrows, spears, &c. The women are sitting on the benches or the ground, making the skins which the men have brought home into different garments, in doing which they use rein-deer sinews instead of thread. Two large iron kettles are hanging over the fire, in which are boiling fish for the dogs. One of the women prepares the frugal dinner or supper, which usually consists of either fish or rein-deer meat, boiled or fried in train-oil. As an occasional delicacy they have baked cakes of fish-roe, or of dried and finely pounded muksuns, which are the substitutes for meal. The cakes are sometimes flavoured with finely chopped fish bellies, or with rein-deer meat and powdered makarscha, mixed with train oil. If a travelling guest arrives, all that is best in the larder is produced; Struganina, the best Iukola, smoked rein-deer tongues, melted rein-deer fat, frozen Iakut butter, frozen Moros'kho, &c. The table, which is at the upper end of the apartment, is covered, instead of a table cloth, with several folds of an old fishing net; and instead of napkins, thin rolled up shavings of wood are used; but indeed this last is a town refinement. Salt seldom appears, and at any rate is only for the guest: the natives never use it, and even dislike it. In the little towns of Nijnei and Sredne-Kolymsk the richer people have tea and Chinese sugar-candy. Iukolas are eaten with the tea instead of biscuit. Bread is every where rare. From the meal, which is so dear that only the rich can buy it, a drink is prepared called Saturan: the meal is roasted in a pan, and butter or train oil is mixed with it so as to bring it into a paste, which is thinned by the addition of boiling water.

When this drink is carefully made, and with good butter, it has an agreeable flavour, and is very nourishing and warming: it may be compared to Rumford's "spare soup." It is drunk hot like tea, out of glasses or cups. Amongst the daily employments of the young women, the fetching water for the household occupies a prominent place: they go at certain hours of the day to holes cut in the frozen rivers, which, like the fountains and village wells in Germany and the rest of Europe, are favourite places for gossiping. About noon the daughter of the house puts on her best attire, and runs down to the river with her water-buckets on a little sledge, where, whilst she is filling them, she hears and tells the news of the day. Occasionally some of the young men attend; and if one of them fills and carries the water-vessels, it is recognised as the omen of an intended marriage.

The Swatki* and Easter time, and particularly the Masslaniza, give a temporary animation to this otherwise monotonous life. On Christmas and Easter days the bells ring, and the inhabitants go to church in their best dresses: when the service is ended, the priest visits each cottage separately, and gives his blessing, whilst he sprinkles it with holy water. During the Swatki and the Masslaniza, there are frequent evening parties for conversation, games, songs, and sometimes dancing, for which, however, the huts are ill adapted in size. They have suppers, and tea is drank in great quantities: ten cups a-piece are quite common; of course the tea is drank without

* Swatki is the time from Christmas to the feast of the Epiphany. Masslaniza is the week before Lent; both are seasons of general festivity throughout Russia.

milk, and almost without sugar, on account of its great price: usually one little piece is supplied to each individual, and suffices for the whole of his tea. A few rich people use tea-pots; but generally the tea is boiled in a large black teakettle, which makes it go further. Next to tea, brandy is in request at these parties, and is sometimes drank in large quantities, notwithstanding its very high price.

At the Masslaniza they use the Russian pastime of sledging and sliding down ice-hills; a curious tribute to national customs, since they never drive in any other carriages than sledges, and over no other roads than snow and ice.

Such is the monotonous life of the inhabitants of these icy deserts. Happily for them, they have hardly any idea of other enjoyments; and if the fisheries and huntings have been productive, and they are safe from hunger, and if tea and brandy are not wanting, they are content, and to a certain degree happy. The inhabitants of Nijnei Kolymsk are a vigorous race, usually above the middle height, and are well-looking. They have few diseases, and one sees many that have preserved activity in old age. This is probably due in great measure to the necessity they are under of taking strong exercise, and being much in the open air. The walking in snow-shoes is particularly beneficial, by bringing the muscular powers into full action. The scurvy, which rages so dreadfully to the westward, is very rare here. This may possibly be owing to the provisions being frozen instead of salted.

CHAPTER IV.

Nijnei Kolymsk.—Domestic Arrangements.—Preparations for Prosecuting the Objects of the Expedition.—Well-founded Doubts respecting the Discoveries of Serjeant Andrejew.—Arrival of the English Traveller, Captain Cochrane.—The New Year.—Evening Party.—Arrival of the Mate Kosmin.—Preparations for a Journey with Dogs and Sledges.—Necessary Deviation from the Original Plan.—Tidings of the Arrival of the Tchuktches, on the Lesser Aniui.—Departure of M. von Matiuschkin for Ostrownoie.

NIJNEI KOLYMSK was founded according to Fisher in 1644, on the northern arm of the stream, where a small fortress or ostrog, a church, and some yourtes were built. The settlement was subsequently moved to its present site, on a low island in the other branch, which is of more convenient access. It is situated according to our observations in lat. 68° 32′, and long. 160° 57′. The variation of the magnetic-needle is 9° 56′ E. and the dip 77° 33½′ N.

The river is here three wersts broad: the view to the south is bounded by the Aniui mountains, which are connected with the Panteljiva range, and the Surowoi rocks: to the North and West the eye loses itself in the barren Tundra. The Ostrog consists of a wooden palisade, with small towers at the four corners, withinside of which is

a large building where the authorities of the place reside, and where there are magazines, which are chiefly empty; two of these contain some stores prepared for the expedition of Lieut. Laptew in 1739; and for the vessels of Captains Billings and Sarytschew. Besides the Ostrog, the village consists of a church and forty-two houses.

There are four other settlements in this district. Karetowa in 68° 47′ N., and 161° 11′ E.; Tschernoussowa in 68° 50′ N., and 161° 13′ E.; Pochodsk in 69° 4′ N., and 160° 55′ E.; and Pantelejiva in 68° 36′ N., and 161° 32′ E. There are besides a few inconsiderable settlements along the banks of the Omolon and the Aniui.

My house, which was one of the largest in the place, consisted of two rooms, each two fathoms* square: the outer room, with a stove, was assigned to my attendants, and served also as a kitchen; the inner one, which had an open hearth, I took for myself; each room had a small window, with a thick plate of ice; a bench for a bed, a little rickety table, and a wooden stool, were all my furniture; a porch which I built outside, somewhat lessened the cold of the house, and was very useful as a store-room.

Half an hour after my arrival, M. von Matiuschkin returned from the mouth of the Kolyma, where he had been to see what could be spared to us from the produce of the fishery. It may well be supposed that we were not a little rejoiced to meet, and had a thousand things to ask and to tell each other. I learnt, to my great disappointment that when he arrived at Sredne Kolymsk, on the 2nd of October, he found that the commissioner of that place had not even begun to

* A Russian fathom is seven feet.

execute the instructions, which he had received in the summer from the Governor at Iakutsk, relative to our expedition. No store of fish had been procured, nor any materials for the erection of an observatory; neither had any steps been taken, as I had desired, towards the establishment of a winter-house and deposit of provisions at the Baranov rocks. The Commissioner's only excuse was, that he did not think we should actually arrive this year.

Our operations must have been even more seriously injured than they were by this neglect, but for the energetic and successful exertions of M. von Matiuschkin. During his short stay he had already procured more than half the necessary provision of fish; and in spite of the intense cold, which made the carpenter's axe break like glass, he had got a tower erected on the flat roof of my house for an observatory, with windows to the four cardinal points. It was completed in a few days after my arrival, and the instruments for the necessary astronomical observations established. My first care was directed to obtain what was necessary for our journey. For this purpose I invited the richest people of the place, and the elders of the different tribes along the neighbouring rivers, to meet me on an appointed day. They came on the 25th of November, and our first step was to form a tariff of prices,* which was tho-

* The following are some of the prices: 1 herring, 1 copeck; 1 pood of dried rein-deer meat, with the bones, 4 roubles; a rein-deer tongue, 10 copecks. For a provision sledge from Nijnei Kolymsk to the Baranov rocks, including food for the dogs, 2 roubles a day; a travelling sledge for the whole journey, 3½ roubles a day; a pack-horse from Sredne to Nijnei Kolymsk 25 roubles; a dressed rein-deer skin, 2 roubles; a pair of birch-wood sledge-runners, 4 roubles.

roughly satisfactory to the inhabitants. We next discussed what each would be able to furnish, and when. The Iukahirs of the Aniui, who had had a very successful rein-deer hunt, were to supply the skins necessary for a winter tent, and a great quantity of rein-deer bones, which were to be pounded for the dogs. The Iukahirs of the Omolon offered to provide a good boat built of birch-wood, and the materials for constructing sledges; and the settlers along the Kolyma were to furnish us with frozen fish. The dried fish had to be brought from 800 wersts up the river, where the fishery had been more productive than at the mouth. There still remained a most essential point, the providing a sufficient number of good dogs to draw the sledges. This was undertaken by a Cossack, who had accompanied M. Hedenström, and was generally considered to have more knowledge than any one else of the qualities and the proper treatment of dogs.

All was now in train, and nothing remained but that every one should fulfil their engagements. I met with many difficulties in this respect, which were increased by a sort of distrust on the part of the people in respect to payment, and by the want of good will on the part of the local authorities. The Commissioner of the district made every endeavour to discourage us. He represented the poverty of the people to be such, that our extensive demands would overburden their resources; and described in exaggerated terms the difficulties and dangers we should have to encounter. He assured us the dogs were too weak, and their drivers inexperienced and untrustworthy; and dwelt on the barbarity of the Tchuktches, whom he described as the most

dangerous and cruel of men. Though I did not attach much importance to his accounts of the dangers that awaited us, I did not feel at liberty, until I had myself some knowledge of the subject, to disregard his repeated representations of the injury which he said would be done to the inhabitants by complying with my requisitions. I abated them accordingly so much that we subsequently suffered. In the following years, when I had become well acquainted with the local circumstanees, I found that I could obtain all that was necessary for the expedition, not only without injury, but with advantage to the inhabitants.

My instructions from the Admiralty, directed that the first year we should proceed to Cape Chelagskoi, where the expedition was to be divided into two parts; that with one of these I should proceed in search of the northern land which the Cossack Andrejew was supposed to have seen, and that the other division, with an officer, should continue the examination of the coast as far to the eastward as circumstances would permit. To do this we should require fifty sledges, six hundred dogs, and at least forty days' provision. As it was necessary to start in February, there remained only three months for preparation.

We endeavoured to collect from the inhabitants all the information which they could afford relative to the country, and all that was remembered amongst them respecting earlier travellers, which might have a bearing on the objects of our expedition. They knew a great deal about the three officers who were here in 1767, but could tell us but little about Serjeant Andrejew, who was here only five years before, i. e. in 1762. They knew generally, that he had been to the Indigirka, and

afterwards to the Bear Islands, but they were ignorant of his supposed discoveries, which are included in our most recent charts; and when we spoke of a land north of the Bear Islands, and of traces of a numerous nomade people in that direction, they treated it as a fable. Some of their own people had accompanied Andrejew on that journey; how then could the discovery and existence of a large inhabited land, have been either unknown or forgotten amongst them?

Many circumstances were related to us respecting Pawluzki's proceedings as early as 1731. These and similar inquiries, the duties of the Observatory, practising in driving sledges, experiments on the distances which our dogs went over in a given time, and various other preparations for our journey, occupied us so fully that the time passed rapidly. The polar night had set in on the 22nd of November; and the beauty of the varied forms of the Aurora, seen on the deep azure of the clear northern sky, was a source of unwearied enjoyment to us almost every evening.

On the 2nd of December, probably by the effects of violent west and north-west winds, the sea-water was suddenly driven into the Kolyma with such force as to produce an opposite current to that of the river, breaking up the ice, flooding the banks, and carrying away the fishing-nets which had been placed below the ice. The owners of the nets comforted themselves with the hope, that the influx of water from the sea would bring with it such a quantity of fish, that the increased productiveness of the winter-fishery would more than compensate for the loss of their nets; and so it proved.

The 31st of December surprised us with the

arrival of the well-known English pedestrian, Captain Cochrane.* We were all not a little pleased by this agreeable addition to our very limited circle; subjects of conversation were abundant, and we sat talking till long after the beginning of the new year, which came in with a temperature of —51°.

The noon-day sun, which ought to have been just visible above the horizon, was intercepted by the ice and snow-hills, which bound the plain; a grey mist lay heavy on the snow-covered surface; the sky became of a whitish colour, and the cold increased on the 3rd and 4th of January to —55°, and on the 5th the thermometer stood for twenty-four hours at —57°. Breathing became difficult, and the panes of ice in the windows cracked. Though sitting close to a large fire, we were not able to lay aside any part of our fur-clothing; and when I wanted to write, I had to keep the ink-stand in hot-water. At night, when the fire was allowed to go out for a short time, our bed-clothes were always covered with a thick, snow-like rime, and my guest, in particular, always complained in the morning of his nose being frozen.

The nearest mountains to the south appeared under all sorts of singular forms, and the more distant ones inverted, with their summits down-

* He had not only been hospitably entertained every where by the way, but the Governor at Iakutsk had given him a Cossack to accompany him to Nijnei Kolymsk, and that part of his foot journey at least was made on horseback and in sledges, without any expense. He expressed a wish to join our expedition in the journey over the ice, for which we were preparing; but the great difficulties connected with means of transport, provisions, &c., for each individual, made me consider it advisable to decline the offer.

wards; whilst the river was apparently narrowed to such a degree, that the opposite bank seemed to be close in front of our houses.

As the continued intensity of the cold made it impossible to go on with the business of placing nets under the ice, the inhabitants returned from the winter-fishing at the mouth of the river. Still the street seemed deserted, for no one who could help it stirred from the fire side; late in the evening especially, when the death-like silence was only broken, at regularly-recurring intervals, by the howling of some hundreds of sledge-dogs.

We heard that, in former years, when the fisheries were more productive, and when many elks visited the Kolyma, Nijnei Kolymsk had been remarkable for its winter-festivities; but the inhabitants complained that these were quite at an end. To give them a little pleasure in this way, and to show our guest some of the amusements of the place, I invited all the principal inhabitants for Twelfth Night, and engaged for the evening one of the best and roomiest houses, belonging to a Cossack who could play the violin. The assembly-room was lighted up with train-oil lamps; the walls were ornamented by a little drapery, and the floor strewed with yellow sand. The refreshments for the ladies were tea, some lumps of white sugar, and cedar-nuts. Supper consisted of fish-cakes, Struganina, dried fish, and frozen rein-deer marrow. Our guests arrived at five o'clock, in their best furs, and, after the first burst of admiration at our arrangements, the ladies took their seats, and began to sing national songs; afterwards, the younger ones played at various games, and danced with slow, and apparently laborious effort, to the sound of the old hunter's

violin. At ten o'clock the company took their leave, with endless thanks for their entertainment, nor were these mere words of course, for a year or two afterwards they still spoke of our agreeable and brilliant party as a bright spot in their remembrance.

Next day we went to visit the remains of the two vessels of Captain Billings, which a flood had carried to some distance inland from the river. Though they had been exposed nearly fifty years to the weather, the wood was still sound.

On the 2nd of February, the mate, Kosmin, arrived with a large quantity of necessaries for the expedition, which he had brought from Iakutsk. He had profited by the involuntary slowness of his journey, to draw up an exact topographical description of the almost unknown country through which he passed. Besides more important matters, he brought us a welcome and long-untasted addition to our very scanty bill of fare, namely, forty pounds of frozen rein-deer meat, and some milk and cream frozen, as is customary in Siberia, in round cakes, which keep fresh for a long time.

We were now coming to the most animated period of the year at Nijnei Kolymsk, namely, when the caravan from Iakutsk, consisting of about twenty merchants each with from ten to forty horses loaded with goods, halt here for a few days on their way to the great Tchuktche fair, at Ostrownoie, and sell a part of their wares to the inhabitants of the district, who assemble from a great distance. The richer traders hasten their return from the banks of the Omolon, where they pass the month of January in obtaining from the wandering Tunguses a large quantity of furs, in

exchange for a little tea, tobacco, and brandy. The Tunguses have a strong passion for brandy, and the traders too often avail themselves to the utmost of this weakness.

The prices this year were :—

	Roubles.
Red fox	8 to 10
Black fox	50 - 150
White stone fox	$2\frac{1}{2}$ - 3
Blue fox	7 - 10
*Sable	10 - 25

The prices of the principal articles brought by the Iakutsk merchants were as follows :—

	Roubles.
1 lb. Circassian leaf-tobacco	$3\frac{1}{2}$
1 lb. white sugar	$4\frac{1}{2}$
1 lb. Chinese sugar-candy	3
1 lb. of tea, of inferior quality	9
1 lb. of fine thread	$3\frac{1}{2}$
1 piece of Kitaika (Chinese cotton), 7 yards, or 9 arschins	10
1 piece of half-silk stuff, about 17 yards	50
1 arschin of coarse linen	1
1 figured cotton handkerchief	6

The superintendent of the district usually arrives soon after the beginning of the fair, for the purpose of embracing this favourable opportunity for collecting the crown dues; he also hears and decides causes, and his visit, by giving scope to the litigious disposition of the inhabitants, often brings dissension where cheerfulness and harmony before prevailed. Meanwhile, we had succeeded

* The prices of sables vary greatly in different years. In 1821 a fine skin cost 40 roubles, and in the following year 15 roubles. The current rouble is rather less than eleven pence of British money.

in obtaining a large quantity of fish for ourselves and our dogs. The supply for the latter was estimated at 81,944 herrings.*

As the time for our departure approached, I found that it would be impossible to obtain for another month the number of drivers, sledges, and above all of dogs, which were necessary for our intended expedition. Under these circumstances, I decided on employing the intervening time in surveying the coast to the eastward as far as our means would permit with the few sledges which were ready, and on sending M. von Matiuschkin for the same period to Ostrownoie, to gain some knowledge of the Tchuktches who came to the fair, and to purchase from them† walrus skins and whalebone for our sledges. But that which I especially recommended to his care, was to endeavour to establish a good understanding with that suspicious people, and to tranquillize their minds as to the object of our visit to their shores, by making them understand that we were in search of a navigable passage, by which ships would be able to bring them a larger and cheaper supply of tobacco and other articles. He also took with him a good supply of tobacco, beads, scissors, &c., &c., as presents to their chiefs.

On the 14th of February I despatched my three

* It included a quantity of rein-deer bones. For convenience in estimating supplies, every sort of provision for dogs is reduced in calculation to an equivalent number of herrings, eight or ten of which are considered, when dried, a proper daily allowance for a sledge-dog.

† Thongs of walrus skin are used here instead of iron fastenings, and are very durable; pieces of whalebone under the wooden runners make the sledge glide along the ice far more easily, nor are they so liable as wood to be injured by the salt which is left on the ice, in places where it has been overflowed by sea-water.

travelling sledges with the proper number of good dogs, under the care of three Cossacks, one of whom understood the Tchuktche language, to an island at the mouth of the eastern branch of the Kolyma, where our provisions were already deposited. Whilst awaiting my arrival, the dogs were to be given good food and rest, to improve their condition to the utmost.

A few days afterwards the Cossack who had been sent by the superintendent to Ostrownoie to give notice of the approach of the Tchuktches, returned with the intelligence that a small party from Tchaun Bay had arrived on the 8th of February within 90 wersts of Ostrownoie, and that they were the forerunners of a much more numerous caravan from the neighbourhood of Behring Straits. The Iakutsk merchants soon took their departure in hired sledges; they were accompanied by the superintendent, and were followed on the 4th of March by Captain Cochrane and M. von Matiuschkin.* Captain Cochrane's plan was to join the Tchuktche caravan on their return to Tchukotsky Noss and Behring Straits, and to cross over from thence to the north-west coast of America; but when he became better acquainted with the Tchuktches, he gave up this scheme and returned to Nijnei Kolymsk.

* The distance to Ostrownoie is 250 wersts: the usual price of a sledge for the journey from Kolymsk and back, is about 100 roubles.

CHAPTER V.

First Ice Journey in Sledges over the Sea.—Departure from Nijnei Kolymsk.—Sucharnoie Island.—Baranov Rocks.—Flat Low Coast.—Great Baranov River.—Cold.—First traces of the Tchuktches.—Meteor.—Cape Chelagskoi.—Kosmin Rock.—Wollok.—Cape Matiuschkin.—Arautan Island.—Loss of Provisions.—Return to Nijnei Kolymsk.

The sea-coast from the Kolyma to Cape Chelagskoi is wholly uninhabited; on the one side the occasional excursions of the Russians terminate at the Baranov rocks; and on the other, the Tchuktches do not cross the larger Baranov River. The intervening eighty wersts of coast are unvisited. The wide mossy plains and valleys inland are wandered over by those warlike Tchuktches who have preserved their independence, and who bring with them immense herds of rein-deer. Strangers are viewed with great suspicion, and melancholy examples have shown the dangers incurred by intruders. Our sledge-drivers were not entirely free from the deeply-rooted fear of these people, generally entertained by the inhabitants of Kolymsk. Our party consisted of Mr. Kosmin and myself, and the drivers of nine sledges. Only three of the latter were to accompany us the whole way; the other six were to return with their

sledges whenever the provisions which they carried should be disposed of.

We left Nijnei Kolymsk on the 19th of February, and on the 21st we reached Sucharnoie Island, at the mouth of the Kolyma, where the rest of our party awaited us. The next day was employed in arranging our loads, consisting of a conical tent of rein-deer skin, with a light framework formed of six long thin poles; two hatchets; an iron plate, on which we could light a fire; a trivet; a soup-kettle; a tea-kettle; a pocket-lantern, with a few wax-candles; some changes of linen; a bear-skin a-piece to sleep on; and a double rein-deer-skin coverlet for every two persons. Our instruments were, two chronometers; a seconds' watch; a sextant and artificial horizon; a spirit thermometer; three azimuth compasses, one of which had a prism; two telescopes; a measuring line, and a few other trifles. The provisions for five men for one month were: 100 lbs. of rye biscuit; 60 lbs. of meat; 10 lbs. of portable soup; 2 lbs. of tea; 4 lbs. of sugar-candy; 8 lbs. of grits; 3 lbs. of salt; 39 rations of spirits; 12 lbs. of tobacco; and 200 of the best smoked Iuchala, each equivalent to about five herrings. Our clothing consisted of a Parka;* a large Kuchlanka; great leathern boots, lined with fur; a fur cap; and gloves of rein-deer skin. We had each a gun and fifty cartridges, a pike, a large knife, worn in the girdle, and the means of striking fire. For our dogs we had 2,400 frozen fresh herrings, and 790 large Muksun Iuchala, and 1,200 Iukola, equivalent to about 8,150 dried herrings. The six provision-sledges carried the greater part of the stores, but a portion was placed on the travel-

* The rein-deer-skin shirt described in page 57.

ling ones. The loading of each sledge, weighing about 25 pood (about 1000 lbs.), was distributed along its entire length, and covered with leather. The whole was bound so tightly together with thongs, that the sledge might be overturned without anything being displaced or injured. The driver sits sideways on the middle of the sledge, or rather poises himself, with his feet on the runners, ready at any instant to spring off to preserve or restore equilibrium, holding on by a thong stretched lengthways on the sledge. He also carries a large stick with iron at one end, and bells at the other, which he uses for guiding and driving the dogs, and which sometimes serves him as a support. It was in this manner that Mr. Kosmin and I sat, each behind our driver, and ready, like him, to spring from the sledge whenever it lost its balance, which was continually happening, as the track was often very uneven. Though each of the sledges carried the above-mentioned load, they glided so smoothly over the hard-frozen snow, that it was not difficult to push them along with one hand. When the surface was even, the dogs went ten or twelve wersts an hour.

On the 21st of February the temperature was —26°; at noon, it increased to 0°·5. Though the sun was still very low, Mr. Kosmin succeeded in taking a meridian altitude (using the artificial horizon), the latitude was 69° 31′. By trigonometrical measurement from Nijnei Kolymsk, Sucharnoie is in 161° 44′; our travelling compass shewed 13½° E. variation.

On the 22nd the provision-sledges started at day-break for the lesser Baranov Rock, forty-one wersts off, and we followed soon after. We had arranged that my sledge should always lead the way, and that Mr. Kosmin's should bring up the

rear. Each of us observed the direction of the course, and estimated the distances from point to point according to the paces of the dogs with which we had made ourselves acquainted by experiments at Nijnei Kolymsk.

Instead of going round Bear Cape, we crossed the isthmus, which connects it with the continent. The snow was hard and even, and our dogs ran so fast that the sledges often overset in spite of all the balancing of our drivers. At half-past three we arrived at the powarna, where we were to sleep. It was on the bank of a small river, and near a large wooden cross, erected by Captain Billings, and still in good preservation. Our provision-sledges, which started nearly two hours before us, did not arrive till later, owing to the inferiority of their dogs. Seen from this place, the ice of the sea appeared smooth; a thick mist concealed the view of the north horizon.

Finding our lodging filled with snow and ice, which it would have taken too long to remove through the door, we took off the boards which served as a roof, and in less than an hour we had cleared away the snow, replaced the roof, and lighted a fire. Unluckily the hut was so small that only four persons could stay in it, and they were so close to the fire that their clothes were singed: the other seven slept in the tent, where they were less warm, but much drier, as the melting snow ran in streams down the walls of the hut.

We passed the evening in entering and comparing our observations, which we found to our great satisfaction agreed extremely well with the very exact survey of this part of the coast by Captain Billings; we were thus convinced that we might place confidence in the suitability of the methods we had adopted.

The sea-coast hitherto was every where flat, except at the promontories and projecting tongues of land, which form steep rocky elevations. The right bank of the Kolyma, which consists principally of black slate, was covered with drift-wood: nine or ten miles from the Balagan at Sucharnoie, we saw a wooden tower, erected by Lieutenant Laptew in 1739, to serve as a land-mark on entering the river from the sea.

We continued our journey next morning at break of day: the weather was clear and pleasant with a light breeze from the S.W., the thermometer at —29° in the morning, —20° at noon, and —26° in the evening. We drove rapidly over the smooth ice along the sea-coast, which became more and more steep and rocky: having gone forty-two wersts, we halted for the night at a powarna not far from the Greater Baranov rock. I had been able by the way to take a meridian altitude of the sun, which gave the latitude of a rather remarkable promontory near the lesser Baranov rock 69° 42′. By our reckoning its longitude was 163° 20′. We saw a great number of those remarkable masses of stone mentioned by Captain Sarytschew, which sometimes resemble ruins of vast buildings, and sometimes colossal figures of men and animals. I shall have occasion to speak further of these remarkable rocks.

On the 24th of February we proceeded with a temperature of —24°, which afterwards sunk to —31°. We left to the north the mountainous promontory of the Greater Baranov Rock, which stretches a considerable distance into the sea, and took our way across a narrow strip of land behind it. The noon observation placed the mouth of a little river which joins the sea to the east of the

cape in 69° 38′. Its longitude by reckoning was 164° 26′. Variation 17° E. From this spot the shore assumed quite a different aspect, the rocks and cliffs disappeared, and the flat coast was only now and then interrupted by slight elevations. We saw to the south, at some distance inland, a chain of mountains running in a N. W. and S. E. direction. After travelling thirty-four wersts, we arrived at the mouth of a little river, the transparent ice of which promised us pure and good water, and as there was also plenty of drift-wood, we determined to halt for the night. This is the extreme eastern point of the most distant hunting excursions of the inhabitants of the district. The coast beyond had not been visited by Russians since Schalarov's voyage in 1765.

I determined to deposit part of our provisions in this place against our return. To secure them from the depredations of the stone-foxes and wolverines, we drove four posts, each nine feet high, into the snow, and raised upon them a large rough chest formed of drift wood, in which we placed the stores, and covered them over with wood and snow. This was our first encampment. A few minutes sufficed for pitching our tent, which was twelve feet broad at the bottom, and ten feet high in the centre. A small opening in the top allowed part of the smoke to escape. A fire in the middle served for cooking and warmth, though it filled the tent with a thick and pungent smoke, which hurt the eyes. The entrance was through a narrow opening on the leeward side, over which we hung a skin. In the high winds which are usual here, our light shelter was in constant movement, bending from side to side; but by heaping a bank of snow round it, we kept it both steadier and warmer.

As soon as the tent was pitched and the fire lighted, we hastened to fill the kettle with clean ice or snow and to make it boil as soon as possible, for we all found tea our most welcome and strengthening refreshment. We generally drank ten or twelve cups each. Sometimes we had a piece of rye biscuit or dried-fish to eat with it.

Between tea and supper the sledge-drivers went out to attend and feed their dogs, which were always tied up for the night, lest they should be tempted away by the scent of some wild animal. Meanwhile we were engaged in comparing our observations, and in laying down in the map the ground which we had gone over in the course of the day: the severe cold, and the smoke which usually filled the tent, sometimes made this no easy task. Supper always consisted of a single dish, soup, either of fish or of meat (as long as we had any of the latter). It was boiled for us all in the same kettle out of which it was eaten. Soon after we had finished our meal the whole party lay down to sleep; on account of the cold we could not lay aside any part of our travelling-dress, but we regularly changed our boots and stockings every evening, and hung those we had taken off with our fur-caps and gloves on the tent-poles to dry. This is an essential precaution, particularly in respect to stockings, for with damp clothing there is the greatest risk of the part being frozen. We always spread the bear-skins between the frozen ground and ourselves, and the fur-coverings over us, and being well tired, we usually slept very soundly. As long as all the sledge-drivers continued with us, we were so crowded that we had to place ourselves like the spokes of a wheel, with our feet towards the fire and our heads against the

tent wall. In the morning we generally rose at six, lit the fire, and washed ourselves before it with fresh snow; we then took tea, and immediately afterwards dinner (which was similar to the supper of the night before.) The tent was then struck, and every thing packed and stowed on the sledges; and at nine we usually took our departure. This arrangement was adhered to throughout the present journey.

On the 25th of February we had a cutting east wind, with a temperature of—24°, and a thick fall of snow. We tried to proceed notwithstanding, but when we had accomplished twenty-four wersts, our dogs could no longer face the wind and snow, and we were obliged to halt on the flat coast. The snow continued to fall throughout the night, so that our tent was quite buried. This indeed sheltered us from the storm, and we enjoyed both the unusual warmth and steadiness of our tent; but we found the disadvantage next morning; the snow in immediate contact with the covering of the tent had partially melted, and formed a crust of ice upon it, which rendered it very stiff and hard to pack, and also much heavier than before.

The next morning was quite calm, and though the thermometer still showed —24°, the air seemed far milder than the day before. The sea was covered with a smooth and solid surface of snow, over which the ice-covered runners* of our sledges glided with such ease, that the dogs ran very fast

* Every evening the sledges were turned over, and water was poured on the runners to produce a thin crust of ice, which glides with incredible ease over firm snow. This operation, which is called *wodiat*, has the additional advantage of protecting the runners. The drivers carefully avoid places where the ice is not covered by snow, and where the *wodiat* or ice-runners soon become useless.

without being urged. We drove at a distance from 50 to 300 fathoms from the coast, which is here low and flat. As far as the eye can reach, it sees nothing but one unvaried surface of snow. One becomes used to everything, but at first the impression produced on the mind by the uniformity of this vast shroud, is indescribable. We hailed the sight of a heap of drift-wood with pleasure, and even the closing in of darkness was a welcome relief.

At noon I took a meridian altitude, by which I deduced the position of the mouth of a small river 69° 35′ lat., and 165° 54′ long. When we had gone twenty-five wersts from our last night's station, I halted earlier than usual, for the purpose of taking lunar distances. The sun's altitude was so low, that we were obliged to have recourse to the stars at night to determine the time: the lunars gave 166° 11′ as the longitude; our chronometers gave it 5′ more easterly. The chronometers must have suffered from sudden changes of temperature, or from shocks by the frequent oversetting of the sledges. They differed also greatly from each other.

We built here another Saiba, in which we deposited provisions against our return, and sent back the empty sledges. When our fire burnt up, the ice which incrusted the tent began to melt, and produced a close damp, which was so oppressive that, in spite of the cold, we were frequently obliged to go into the open air. The temperature sunk in the night to —37°, with a cutting wind from the S.W. Notwithstanding our furs, we were several times under the necessity of warming ourselves by exercise. On the next morning M. Kosmin complained in quite an unusual manner of his feet. We advised him to change his

boots and stockings, which he had omitted to do the night before. When the boots were taken off, we saw with no little alarm that the stockings were frozen to his feet. After drawing them off with great care, we found a layer of ice of the thickness of a line interposed between the stockings and feet. Happily the latter were not yet frozen, and by gentle rubbing with a little brandy, they were soon restored. This experience gave us a further warning of the dangerous consequences in intense cold of sleeping in damp clothing, whether arising from external causes, or from the evaporation from the skin. At noon, when we were $1\frac{3}{4}$ wersts north of the low coast line, I observed the latitude 69° 30′, the longitude by reckoning was 166° 27′, and the variation $17\frac{1}{2}$° east.

The increasing cold and violent wind made travelling very difficult. To guard the dogs from being frozen, the drivers were obliged to put clothing on their bodies, and a kind of boots on their feet, which greatly impeded their running; and the intense frost had rendered the snow loose and granular, so that the sledge-runners no longer glided smoothly over its surface. We could now only accomplish 26 wersts before we halted for the night of the 27th, at the mouth of a river of some importance, known by the dwellers on the banks of the Lesser Aniui, under the name of the Great Baranika. We saw immense quantities of drift-wood here, and along the whole strip of flat coast which we had passed during the day. To the south and south-west of our sleeping-place were distant mountains, extending to the east bank of the river. The coast here makes a bend to the northward, and gradually rises to a height of six fathoms.

Immediately to the north of us there appeared a white line running apparently parallel to the coast, which we afterwards found to be large torosses or hummocks of ice, which seen at a distance may easily be mistaken for land.

During the night I took some distances of the Moon and Pollux, but failed in determining the longitude, for when about to observe altitudes of Capella for time, I found that crystals were forming in the mercury of the artificial horizon, by which its surface, without absolutely freezing, was rendered too uneven to give a true reflection. Indeed our observations generally, with instruments of all kinds, were rendered difficult by the intense cold. We were obliged to cover with leather all those parts of our sextants which came in contact with the hand or the eye, otherwise the skin instantly froze to the metal. During an observation, and particularly when reading the divisions on the arc of the sextant, we had to hold our breath carefully, otherwise the surface became obscured by a thin coat of ice, or by a kind of rime; indeed, this often happened from the mere evaporation from the skin when we were at all warm. However, by practice we were enabled to use the sextant at a temperature of —36°, and to note with sufficient exactness, the degrees, minutes, and seconds of arc, by the faint light of a hand-lantern. The chronometers stopt: I had been afraid of this, and had tried to guard against it by always wearing them during the day, and by placing them at night in a box, which I wrapped in thick furs and took with me under the coverlit. In spite of all these precautions, the cold congealed the oil in the works.

On the 28th of February the temperature varied

from —29° to —25° with a fresh S.W. breeze, but as the wind was in our backs, we felt it less. The day was so foggy that we could hardly distinguish the line of coast to our right, but we directed our course to a high promontory visible through the fog. We pitched our tent under the shelter of a steep bank, having made only 27 wersts, on account of the loose and granular state of the snow. We climbed the hill, and found at the top some boards, rein-deer-sinews, and burnt wood, which showed that there had been a habitation of some kind. Towards evening the weather cleared, and M. Kosmin was able to take some lunar distances, by which we made our longitude 167° 43′. By a meridian altitude of the moon the latitude was 69° 38′. We erected here a third deposit of provisions.

In the night one of the dogs barked loudly: we all jumped up and ran out, but could see nothing; the drivers maintained that the dog must have scented a wandering party of Tchuktches, and they could not sleep a wink the rest of the night, for fear of a surprise.

On the 1st of March, the thermometer was at —25° throughout the day, and a light breeze from the N.E. cleared the air. At noon we observed the latitude 69° 43′, variation 18½° E.

The coast, which runs here in a N.N.W. direction, is tolerably high, forming a sort of wall of earth, rising five or more fathoms above the surface of the sea. At the foot of it we found a deserted Tchuktche hut; it had not been long forsaken, for the traces of sledges were still visible. Our drivers were much alarmed, and I thought it prudent to keep a watch at night.

At a distance of three and a half wersts from the spot where we had observed the latitude at

noon, we came to a considerable opening in the coast, which we took at the time for a bay, but which our survey in the following year has shown to be a passage between the continent and an island to which Schalarov gave the name of Sabadei.* We crossed this strait, and about the middle of it came on some Tchuktche huts, built of drift larch-wood. They were empty, and we could not judge of the direction in which the inhabitants had gone, as snow had covered the tracks of their sledges. The shore of the main land is flat; that of the island is steep, and is twenty fathoms or more in height. By a meridian altitude of the Moon, the latitude of our sleeping place was 69° 49′, and its longitude by distances of the Moon from Aldebaran, 168° 04′.

Here we found fresh traces of the Tchuktches, and from the summit of a neighbouring hill, we saw an extensive Tundra at some distance towards the N.E. In this day's journey we saw an unusual phenomenon: in the N.E. horizon there appeared an insulated dark-grey cloud, from which white beams streamed to the zenith and across it to the opposite horizon, resembling the beams of the Aurora, but whether luminous or not we could not tell, on account of the daylight. The phenomenon lasted about half an hour. One of our Cossacks, who had been before on the Polar Sea, maintained that the cloud was occasioned by vapour rising from a sudden crack in the ice. On the same evening there was an Aurora extending from N.E. to N.W.

Next morning the weather was clear, and the temperature —30°. Soon after we started, M. Kosmin thought he saw land in the distance. We

* Aiun Island in the map.

immediately ascended a hill, and saw that the supposed land was nothing but hummocks of ice, piled up beyond a large Polynia, or space of open water, which extended from east to west, as far as the eye could reach. Our observed latitude at noon was 69° 52′. About two wersts from hence the shore becomes flat: this point of junction of the high and the low coast, is probably Lieutenant Laptew's Sand Cape, though there is no projecting point of land which can properly be called a cape; the longitude by our reckoning was 168° 00′. Thence we proceeded sometimes over the ice of the sea, and sometimes over the coast, which is so low, that it is probably overflowed in summer; a range of sand-hills ran parallel at a short distance. Drift-wood had become scarce, but we found some boards which apparently had been left by Tchuktches, whose traces were numerous. We halted at the end of thirty-five wersts, and made a fourth deposit of provisions. The last of the provision-sledges returned from this point, and our party now consisted only of three travelling sledges, M. Kosmin, myself, and three Cossack drivers. By a meridian altitude of the moon, the latitude was 69° 58′: and the long. by reckoning and angles, 168° 41′.

We saw this evening an Aurora of extraordinary beauty. The sky was clear and cloudless, and the stars sparkled in their fullest arctic brilliancy. With a slight breeze from the N.E. there rose in the E.N.E. a great column of light, from which rays extended over the sky in the direction of the wind, in broad and brilliant bands, which appeared to approach us, whilst they varied continually in form. From the rapidity with which the rays shot through the whole space from the

horizon to the zenith, in less than two seconds, the Aurora appeared to be nearer to us than the ordinary height of the clouds. We could perceive no effect on the compass-needle.

Our Cossacks had repeatedly represented the necessity of allowing our dogs a longer rest, and we halted for that purpose on the 3rd of March, though we ourselves suffered a good deal from cold, as we were on an unsheltered flat, with a temperature from —25° to —33°, and a cutting wind from the N.E.; we were also most of the time without fire, as we had barely fuel enough to cook with. We were, also, under some degree of anxiety and uncertainty as to our future proceedings. We were ignorant of the true position of the Cape Chelagskoi, of which we were in search, and the low state of our provisions would not admit of our taking the more certain, but very circuitous course by the coast, which here trended southerly. Whilst I was doubtful on what to decide, we saw at sunset two considerable hills in the eastern horizon, towards which we determined to direct our course.

Next morning the sky was clouded, and the temperature —2°, with a gentle breeze from the S.E. Our drivers envied the good fortune of the Tchuktches, who enjoyed so mild a climate. We kept a direct course across the ice, until we had gone sixty-one wersts, when the weariness of our dogs, and the approach of night, obliged us to halt among ice-hummocks. We ascended one of these, and saw from its summit that the land to the east formed a promontory connected with a range of hills running to the south. As we gazed, we thought we saw the rocks and precipices of the promontory reflected on a smooth

surface of open water; in a few minutes the open water seemed changed into a smooth surface of ice, which presently became covered with numerous inequalities, which varied their form every moment. At last, as the position of the sun became a little altered, the whole disappeared, and we saw clearly an almost impassable range of enormous hummocks extending in every direction. The strong refraction renders these optical illusions and transformations extremely frequent on the Polar Sea, and the traveller is often misled by them. We had exhausted our fuel, and were obliged to burn three of our tent-poles, and a pair of spare sledge-runners, to boil our soup; the rest of the time we had no fire: fortunately the wind continued from the S.E., and the temperature was not below —8°.

On the 5th of March, thirty wersts of laborious travelling amongst hummocks of ice, brought us to the N.W. point of the Chelagskoi Noss. The doubling this cape was a work of difficulty and danger. We had often to ascend steep icebergs ninety feet high, and to descend at great risk to the sledges, the dogs, and ourselves: at other times we had to wade up to our waists through loose drifted snow, and if we came occasionally to smooth ice, it was covered with sharp crystallized salt, which destroyed the ice-runners, and made the draught so heavy, that we were obliged to harness ourselves to the sledges, and it required our utmost efforts to drag them along. The Cape was sometimes totally concealed from view by intervening masses of ice, but wherever we approached the shore, it appeared to consist of a black, dense, and glistening rock, in regular vertical columns of 250 feet and upwards in

height, with occasionally intervening dykes, some fathoms in breadth, of a whitish fine-grained granite. Having accomplished about nine wersts in five hours, with the greatest efforts, both men and dogs were so completely exhausted, that we were obliged to halt for the night in a little bay with a sandy beach, where to our great joy we found drift-wood, and had the comfort of an excellent fire, by which our strength was so much recruited, that we did not feel the cold the next day (6th March) when the temperature was —11°, with wind and driving snow. The mountains which form the promontory, appear to be above 3000 feet high. In the bay where we slept, we saw remains of fires and whalebones.

As we had now only three days' provisions remaining, it appeared very doubtful whether we might venture further. However, I decided on going sufficiently far to judge of the general trending of this part of the coast, which was supposed, according to Burney's well-known views, to form an isthmus connecting Asia with America. I proceeded, therefore, with the best of the dogs, and two unloaded sledges, leaving the third under the charge of one of the Cossacks. Luckily we found a narrow strip of smooth ice, which enabled us to get on rapidly. The direction of the coast, apart from unimportant indentations, trends S. 80° E. It consists chiefly of projecting points formed of the black rock above-mentioned, and of black slate, with occasional intervening sandy beaches. I observed the latitude at noon 70° 03′, seventeen wersts from our sleeping-place. About twelve wersts further on, the rocks are replaced by a sandy shore, and the hills retire inland. We saw at a distance of twenty-four miles, S. 48° E.

(true), a promontory, which I named Cape Kosmin, after my zealous fellow-traveller. To judge by the immense blocks of ice close to the shore, the depth of water must be very considerable, and the absence of bays must render navigation dangerous, as vessels would be exposed to the pressure of the ice, without any place of refuge.

The want of provisions now obliged us to return; and I was forced to content myself for the present with having ascertained that for 40 miles to the east of Cape Chelagskoi, the coast trended in a S.E. direction. We marked the termination of our journey by the erection of a pyramid of large stones on a remarkable hill not far from a stream, which I named Poworotnoi (The Return). This pyramid is in 70° 01′ latitude, and 171° 47′ longitude, and is 418 wersts from our starting-point at Sucharnoie.

Late at night we reached our tent, on the east side of Cape Chelagskoi, where we found the Cossack engaged in erecting a large wooden cross as a memorial. We assisted him to place it in a conspicuous situation, and engraved on it the date of our visit. On the morning of the 7th of March we began our homeward journey, with a temperature of —31°, a cutting wind, and driving snow. To avoid the hummocks we took our way inland over some low hills, and to our great joy, after we had gone five wersts, we saw the smooth sea-ice. This is probably the Wolok or portage over which Staduchin passed in 1700, when in proceeding by water from the Kolyma, he found himself unable to get round the cape which he called the great Tchuktche Cape, and which subsequently received the name of Cape Chelagskoi. We followed the coast in a southerly direction, and pitched our

tent for the night in a bay 25 wersts from the Wolok. Here we found a quantity of drift larch-wood. We had a light breeze from the west, and a temperature of —35° in the morning, —29° in the evening. We observed the latitude, at noon 69° 45′, and the variation 18° E. by the mid-day shadow. We saw a cape 4½ wersts off, in a S.S.W. ¼ W. direction, to which I gave the name of Cape Matiuschkin. It is in 69° 44′ latitude, and 170° 47′ longitude. A flat island lying between W.N.W. and S.W. and only separated from the main by a narrow arm of the sea, is called by the Tchuktches, Arautan. We turned round the southern point of this island, and took our course to the westward across Tchaun Bay. After travelling 25 wersts we came to the low island of Sabadei.

On the 9th of March we arrived late in the evening at the place where we had made our fourth deposit of provisions. Happily we found it undisturbed; we had consumed, the day before, the last remains of those which we had taken with us. Subsequently we were less fortunate. At the three other deposits, in spite of the precautions we had taken, we found nothing but fish-bones, and numerous traces of stone-foxes and wolverines. Notwithstanding the utmost frugality, both ourselves and the dogs had to go the last two days without food. I encouraged my companions by the assurance that we should find at Sucharnoie provisions, dogs, and sledges, according to the orders which I had left; but in this we were disappointed, we found no one there, and had to continue our route to Nijnei Kolymsk, where we arrived on the 14th of March, having been absent 22 days, and having travelled 1122

wersts. Dr. Kyber had arrived from Iakutsk on the 20th of February, but his health had suffered so much from his winter journey, that he was unable to accompany us on our next expedition over the ice.

M. von Matiuschkin returned on the 19th of March; having executed his mission with the greatest success. The Tchuktche chiefs had been highly gratified by the presents sent to them, and had given him the strongest assurances of a friendly reception at their various settlements. None of them had ever seen or heard anything of a land to the north of their own coasts.

CHAPTER VI.

M. von Matiuschkin's Account of the Fair at Ostrownoie.—Remarks on the Tchuktches whom he met there, and on the Shamans.

We left Nijnei Kolymsk on the 4th of March, our party consisting of Captain Cochrane and myself, a Cossack, and a Iakut, who understood the Tchuktche language, and served as interpreter. After reaching the Lesser Aniui, we followed its course, passing many huts scattered along the banks, the inhabitants of which had already left them to proceed to the fair; the well-beaten tracks made by the various passengers in the same direction rendered our journey both rapid and easy. We arrived on the 8th at what is called the Fort of Ostrownoie, a few huts surrounded by a palisade, situated in an island in the Lesser Aniui.

A great number of persons had already assembled, and the scene was in a high degree animated and curious; especially at night, when illuminated by the blazing fires of the various bivouacs and tents, it contrasted with the calm brilliancy of the starry canopy above, and the pale-green, reddish or straw-coloured light of the incessantly varying Aurora, which was visible almost every night. The Russian merchants arrived the next day with 125 loaded pack-horses. The Tchuktches were here before us, and had encamped on the islands and banks of the river. They came from the ex-

trême eastern point of Asia, bringing furs and walrus teeth, which they had crossed Behring's Straits to procure from the inhabitants of the north-west coast of America. They brought with them their women and children, their arms, their household goods, and their moveable houses of rein-deer skin, all conveyed on sledges drawn by rein-deer. The journey occupies five or six months, for though the distance in a straight line is little more than a thousand wersts, they make long circuitous routes in search of pasture. They also visit two other places,* where a market of inferior importance is held. After remaining eight or ten days at Ostrownoie, they commence their return, so that their life is actually passed on the road, allowing barely the time for necessary preparations, and for their visits to the American coast. These are made in Baidars or boats formed of skin. The storms and frequent thick fogs render the passage dangerous in such frail vessels, and they usually stop on the way at the Gwosdew Islands. The trade with the Americans is an exceedingly profitable one, both to the Russians and to the Tchuktches; the latter are in truth only carriers, as they buy the furs and other articles with the Russian tobacco, hardware, and beads; they give half a pood of tobacco to the Americans for furs, which they sell to the Russians for two pood of the same tobacco; thus their gain is 300 per cent. The same two pood of tobacco may cost the Russian trader 160 roubles at the outside, and he sells the furs bought therewith for at least 260

* Anadrysk and Kammenoie, at both which places the great fair used to be held; its removal to Ostrownoie, which took place forty years ago, is a great convenience and advantage to the Russians.

roubles, a profit of 62 per cent. The furs consist chiefly of black and silver grey fox, stone fox, lynx, wolverine, river-otter, beaver, and a species of marten unknown in Siberia, of remarkable beauty, and nearly resembling the sable in the nature and colour of the fur. Besides these the Tchuktches bring from America bear-skins, thongs of walrus-skin, and a quantity of walrus-teeth. They add nothing of their own, except whalebone sledge-runners, a large quantity of clothing made by themselves from the skin of their rein-deer, and a kind of bag of seal-skin, in which they pack the American furs.

The Russian wares are suited to meet the demands of the Tchuktches. Except a little tea, sugar, and cloth for the settlers of their own nation who may come to the fair, they consist of tobacco, and all kinds of iron and hardware, such as kettles, hatchets, knives, &c., and beads of various colours. The traders *would* bring a quantity of brandy if they were not restrained by a highly wise and beneficent regulation of the government, in consequence of which only a very small quantity is secretly smuggled, and is bought by the Tchuktches at almost incredible prices; they call it *wild-making water*; and some will give the most beautiful fox-skins, valued at 250 roubles, for a couple of bottles of bad brandy, which cost only a few roubles at Iakutsk. The fair is visited besides by the various natives of a district of above 1000 wersts in extent, Iukahirs, Lamuts, Tunguses, Tchuvanzes, and Koraks. Their various clothing and equipages add greatly to the animation and variety of the scene.

Before the fair begins, the principal persons on both sides assemble to fix a tarif for the different

wares. After much discussion it was settled that two pood of Circassian tobacco should be the price of sixteen fox and twenty marten skins, and of other articles in proportion; any one who is known to sell for lower prices is made to pay a fine, and loses the right of trafficking during the remainder of the fair; without some such regulation the avidity of the Russian traders would lead them to spoil their own market by too eager competition.

On the 11th of February the fair was opened by hoisting a flag over the gate of the Ostrog. At this signal the Tchuktches advanced in order, fully armed with spears, bows and arrows, and ranged themselves, with their sledges and goods, in a semicircle in front of the fort, where the Russians, and the other tribes, awaited the ringing of a bell, which was to give notice that the traffic might commence. The moment it sounded, it seemed as if an electric shock had run through the whole of the party in the fort. Old and young, men and women, all rushed forward in mad confusion towards the Tchuktches; every one endeavoured to be first at the sledges, to obtain the best, and to dispose of his own wares to the most advantage. The Russians were much the most eager of the whole; they might be seen dragging, with one hand, a heavy bag of tobacco, and having in the other a couple of kettles, whilst hatchets, knives, wooden and metal pipes, long strings of beads, &c. &c. were stuck round their girdles, or thrown over the shoulders, as they ran from sledge to sledge proclaiming their wares, in a language which is a medley of Russian, Tchuktche, and Iakut.

The noise, the press, the confusion, would defy description. Some were thrown down by the throng in the deep snow, and run over by their

competitors; some lost cap and gloves in the fall, and, not stopping to recover them, might be seen with bare heads and hands, in a temperature of —35°, intent only on making up for lost time, by a double activity. The excessive eagerness of the Russians exhibited a remarkable contrast to the composure and self-possession of the Tchuktches, who stood quietly by their sledges, and made no reply to the torrent of words of their customers, until a proposal met their approbation, when the exchange was effected at once. It appeared to us that their calmness gave them a great advantage over the Russians. They had no scales, but judged the weight very correctly by the hand. The average value of the goods brought to this fair is said to be nearly 200,000 roubles; the fair lasts about three days, and, at its close, the various parties disperse.

I availed myself of the first assembly in the Ostrog to converse with the principal chiefs on our intended journey to their country, and on its objects. The persons of most note in this conference were Makamok and Leutt, from the Bay of St. Lawrence; Waletka, whose countless herds of rein-deer feed to the east of Cape Chelagskoi, and Ewraschka, whose tribe nomadize near Tchaun Bay. I told them that the Emperor had sent us to examine the coasts of the Icy Sea, for the purpose of discovering whether, and by what route, vessels could reach their shores, and bring them such articles as they required in greater abundance, and at a cheaper rate than they could obtain them at present; and I asked if, in the course of these researches, we should meet with their people, whether we might reckon on a kindly reception, and on obtaining any assistance which

we might want, and which would be amply rewarded. Of this I received, from all the chiefs, the fullest and most satisfactory assurances.

Captain Cochrane was less successful, he gave himself out as a merchant who wished to travel through their country to the Bay of St. Lawrence, and to cross over from thence to America; and offered to give a suitable renumeration of tobacco and brandy for a safe passage.

Leutt asked no less than thirty pood of tobacco for conveying him by the month of June to Metchigme Bay. Waletka offered to take him, without recompense, to the river Werkon, where he would recommend him to another chief, who would either take him on to Behring Straits, or, if he preferred, would bring him back to Ostrownoie next year. Leutt's demand was too high, and the disinterestedness of Waletka's proposal gave rise to suspicion. Captain Cochrane had, moreover, the opportunity of seeing that they were people amongst whom he would have to suffer much, and could learn little, from the great difficulty of their language, of which he was entirely ignorant. He also judged from their rude and passionate character, that he should run some risk of being deserted, or even put to death; and on the whole he determined to return to Nijnei Kolymsk.

The Tchuktches are in many respects a peculiar race, and are very little known. They have very rarely been visited by persons of observation, and even these have contented themselves with describing their clothing, and a few striking ceremonies. A longer residence, and a knowledge of the language would be requisite to obtain correct views as to their modes of life, and general cha-

racter. I cannot pretend to supply this deficiency, but I may furnish towards it the little I could learn on the present and on other occasions, either directly from themselves, from my own observation, or from the accounts given by the Russian settlers, who are their neighbours. They have preserved their original nationality far more than any other race in Northern Asia. Their weakness has taught them to wish for peace, and their severe encounters with the conquerors of Siberia have greatly narrowed the limits of the territory within which they wander free and independent. Like other uncivilized people, their wants are few; their rein-deer supply them with food, clothing, and habitation; and they regard with contempt the other aborigines who are content to live under Russian dominion. Before the conquest of Siberia, they and their neighbours were constantly at war; nevertheless, they made common cause against the invaders: still the strife was too unequal, and the Tchuktches, who had been till then always accustomed to victory in conflicts with their weaker neighbours, were fain to retire into deserts difficult of access, and offering little to tempt further invasion. It was long before any peaceful commercial intercourse took place, and when it did, it was at first only on the confines of their own territory, where the Tchuktches came in strong force and thoroughly armed. They have gradually gained more confidence in the peaceable intentions of the Russians, and they now come with their wives and children some way within the Russian boundary. This intercourse, by making them acquainted with milder manners, has in some degree mitigated their fierce character. No doubt, in process of time, they will assimilate

more and more to the Russians, and will at length become united with them as their neighbours have done. A great number of Tchuktches have been baptized, but it must be admitted that they are as complete heathens as ever, and have not the slightest idea of the doctrines, or the spirit of Christianity. A priest from Nijnei Kolymsk attends the fair, and is ready to baptize those who present themselves, which they are induced to do solely to obtain the presents which it is customary to make them on the occasion. No instruction is given them, and it is hardly possible that there should be, whilst their present wandering mode of life continues. Their language, which is not understood by the priests, offers a no less formidable difficulty. The Petersburgh Bible Society attempted the translation of the Ten Commandments, the Lord's Prayer, the Creed, and, if I am not mistaken, one of the Gospels, into a Tchuktche dialect, printed in Russian characters; but partly from the language being entirely deficient in words to express new and abstract ideas; and partly for want of letters to convey the variety of strange and uncouth sounds of which the language itself consists, I was assured by all who could form an opinion on the subject, that the translation was wholly unintelligible.

Polygamy is general amongst them, and they change their wives as often as they please. Still, though the women are certainly slaves, they are allowed more influence, and are subjected to less labour than among many other savages. Amongst other heathenish and detestable customs, is the inhuman one of killing all deformed children, and even all those who appear difficult to rear, and all their old people, as soon as they become unfit for

the fatigues and hardships of a nomade life. Two years ago there was an instance of this in the case of one of their richest and most respected chiefs. Waletka's father became infirm and tired of life, and was put to death at his own express desire, by some of his nearest relations.

Every tribe and every caravan is accompanied by one or more Shamans, who are consulted on all important occasions, and their decisions are rarely controverted. The extent of their power was shown, amongst other instances, by a terrible one which occurred at Ostrownoie fair in 1814. A sudden and violent disease had broken out amongst the assembled Tchuktches, and had carried off not only many men, but also a large number of rein-deer, which form their chief wealth. After having had recourse in vain to their usual conjurations, drummings, and jumpings, the Shamans held a general consultation amongst themselves, in which it was determined that one of the most respected chiefs, whose name was Kotschen, must be sacrificed to appease the irritated spirits.

Kotschen was so highly regarded by the whole nation, that notwithstanding the usual implicit obedience to the commands of the Shamans, their sentence on this occasion was rejected. But as the sickness continued to rage, and as neither presents, menaces, nor severe treatment* were successful in inducing the Shamans to alter: Kotschen himself, like another Curtius, declared his

* It is not unusual to chastise a Shaman severely, in order to induce him to withdraw or alter a sentence which he may have pronounced, and the attempt sometimes succeeds; but if the Shaman has fortitude enough to hold out, his reputation is sure to be enhanced thereby.

willingness to submit. Still the love which was borne to him by all was such, that no one could be found who was willing to execute the sentence, until at last his own son, prevailed on by his father's exhortations, and terrified by his threatened curse, plunged a knife into his heart, and gave the body to the Shamans.

It is remarkable that Shamanism has no dogmas of any kind; it is not a system taught or handed down from one to another; though it is so widely spread, it seems to originate with each individual separately, as the fruit of a highly excited imagination, acted upon by external impressions, which closely resemble each other throughout the deserts of Northern Siberia. The Shamans have been represented as being universally mere gross deceivers; no doubt this is true of many of them, who go about the country exhibiting all kinds of juggling tricks and obtaining large presents by so doing; but the history of many is, I believe, very different. Certain individuals are born with ardent imaginations and excitable nerves. They grow up amidst a general belief in ghosts, Shamans, and mysterious powers exercised by the latter. The youth receives strong impressions, and desires to obtain a part in these supernatural communications and powers. No one can teach him how to do so. His imagination is worked upon by solitude, the contemplation of the gloomy aspect of surrounding nature, long vigils, fasts, the use of narcotics and stimulants, until he becomes persuaded that he too has seen the apparitions which he has heard of from his boyhood. He is then received as a Shaman, with many ceremonies, which are held in the silence of the night, and he is given the magic drum, &c.

Still all his actions continue to be the result of his individual character. A true Shaman is not a cool and ordinary deceiver, but a psychological phenomenon, well deserving of attention. Whenever I have seen them operate, they have left me with a long-continued and gloomy impression. The wild look, the blood-shot eyes, the labouring breast, and convulsive utterance, the seemingly involuntary distortion of the face, and the whole body, the streaming hair, even the hollow sound of the drum, all contributed to the effect; and I can well understand that the whole should appear to the uncivilized spectator as the work of evil spirits.

I return from this digression to a notice of the Tchuktche camp. The tent of a chief might be distinguished among every ten or twenty, by its greater size and height. It was usually pitched near a tree, on the branches of which hung bows, arrows, quivers, clothing, skins, and household articles; a few chosen rein-deer were tethered and fed with fine moss; fires were burning in the open air as well as in the tents, and men and women clothed with furs, and covered with rime, were moving about as gaily as if it were summer, in a cold of —41°.

The tents consist of an outer one called *namet*, having an opening in the centre for the smoke to escape, and serving as a shelter to the fire and to one or more *pologs* or small sheds. The polog is a sort of square chest formed of skins stretched over laths, and so low that persons inside can only sit on the ground, or at the utmost move a little on their knees. It has no opening for admitting air or light, and is entered by creeping through the smallest possible aperture, which is then carefully reclosed. An earthen vase filled with

train-oil and supplied with a wick of moss, gives light and warmth, and the heat of this small close box is so great, that the inhabitants wear scarcely any clothing during the most intense cold. There are often two or three of these pologs under one namet, each containing one of the wives of the master of the tent with her children.

Leutt invited me to pay him a visit, and I rejoiced at an opportunity of seeing something of their domestic arrangements, but as soon as I had succeeded in creeping into the polog I was well-nigh suffocated by the fumes from the stinking oil, and the evaporation from six naked people. My awkward entrance and disconcerted air excited the merriment of my host's wife and daughter, who were engaged in decking their hair with beads in honour of my visit. They placed before me some rein-deer meat in a dirty wooden vessel, and added a little rancid oil to improve the flavour; I was obliged to get down a morsel or two, whilst my host praised his wife's cookery in broken Russian, and swallowed a quantity of meat and broth, without salt, to which this people have a great aversion. I shortened my visit as much as possible, but my clothes retained for many days the smell of the polog. It is wonderful how they can endure such a pestiferous atmosphere, though apparently it does not injure their health, for they are a remarkably strong and powerful race. They are distinguished from the other Asiatic races by their stature and their physiognomy, which appears to me to resemble that of the Americans, but their language is different. They call themselves *Tchekto*, people.

Another Tchuktche chief, called Makomol, invited me to see a race on the ice near his camp, and came for me in his sledge. We found a

number of persons from the fair, who were desirous of witnessing the race, and who lined both sides of the course. The three prizes consisted of a blue fox-skin, a beaver-skin, and two particularly fine walrus teeth. At a given signal the race began, and we admired the extreme swiftness of the rein-deer, no less than the skill of the drivers. The victors were loudly applauded by the whole assembly, but especially by their countrymen, whose suffrages they appeared principally to value.

The sledge-race was followed by a foot-race, which I thought still more curious in its way. The runners were clad in the usual heavy and cumbrous dress of furs, in which we moved with difficulty, yet they ran as lightly and as swiftly over the snow, as our best and most elegant runners can do in their light jackets and thin shoes. I was particularly struck by the length of the race, which could hardly be less than fifteen wersts. The victors in the foot-race received prizes of inferior value, and some applause; the Tchuktches appear to attach a higher value to success in the sledge-race. After the games were ended, the whole party were entertained with boiled rein-deer meat, cut up in small pieces, and served in large wooden bowls, which were placed on the snow. Every one came to receive his portion, and the good order and quietness which prevailed were quite remarkable; neither during the races nor at the meal which followed, did I see any crowding, pushing, or quarrelling. The general good behaviour was such as is not always met with on similar occasions in more civilized countries.

Next day a large party of Tchuktches, both men and women, came to visit and take leave of

me. I had nothing to set before the ladies but tea and sugar-candy. They were pleased with the sugar, but would not touch the tea. After this scanty entertainment, I distributed blue, red, and white beads, and the good humour of the party was such, that the ladies offered to show me one of their dances. They stood up in a circle, and moved their feet and body backwards and forwards without changing their place, and beat the air with their hands; then three distinguished performers began a favourite national dance; this was much admired by the spectators generally, but we strangers could see only three mis-shapen oily figures, who made a number of frightful grimaces, and jumped to and fro, until exhaustion obliged them to desist. The interpreter recommended that a small cup of brandy and a little tobacco should be given to each of the three dancers. This was done, and the whole party soon after dispersed, with repeated invitations to visit them in their own country. The sixth day after our arrival the fair concluded; the chiefs paid me one more formal visit, for the purpose of renewing their assurances of a friendly reception, and then took their departure in five or six caravans; the rest of the assemblage dispersed in various directions; and the next fall of snow obliterated all traces of the busy scene, except a number of foxes and wolverines, who usually come to look for bones and other remnants of food which may be left.

I quitted Ostrownoie on the 16th of March, the dogs were refreshed by good food and rest, and the snow was well beaten by the number of travellers; these circumstances made our journey a rapid one, and we arrived on the 19th of March at Nijnei Kolymsk.

CHAPTER VII.

Second Ice Journey.—Preparations.—Plan.—Departure.—Bear Hunt.—First Encampment on the Ice of the Polar Sea.—Four Pillar Island.—Ice broken up and covered with Sea-Water.—Hummocks.—Deposit of Provisions.—State of the Ice.—Easter.—White Bears.—The Bear Islands.—Return to Nijnei Kolymsk.

The preparations for our second journey over the ice resembled in most particulars those already described, being only much more extensive, as our journey was intended to be much longer, and our party more numerous. Some additional articles, however, appeared to be requisite on the present occasion, when our nightly halts would be made on the ice at a distance from land, and when we might expect to encounter frequently hummocks of ice, similar to those which he had met with at Chelagskoi Noss. The advanced season rendered it also probable that we might sometimes find the snow imperfectly frozen. On these accounts we took with us crowbars for breaking the ice, a portable boat made of skins for crossing lanes of open water, and a quantity of whalebone to bind under the runners of our sledges, when we came to places either covered with unsound snow, or with crystals of salt left by the overflowing of the sea-water. I added to the instruments, a dipping-needle, and a sounding-

line. We took only 30 days' provisions for ourselves and our dogs (of which we had 240) trusting that our stock might occasionally be replenished by success in bear-hunting.

Especial care was bestowed on the selection and preparation of the travelling sledges which were to serve us throughout the present expedition; the six best and longest sledges, and the strongest and best dogs were set apart for the purpose; the stores and provisions were to be conveyed in fourteen other sledges, which were to be sent back to Nijnei Kolymsk as they should be emptied. The dogs belonging to the travelling sledges were sent forward to Sucharnoi, where they arrived on the 16th of March, and were prepared for the journey by good feeding and rest. M. von Matiuschkin followed on the 22nd, to superintend the distribution and packing of the stores. When I arrived on the 25th, every thing was in perfect order for our departure. The sledges were all packed, the lading of each weighing about 30 pood; the runners had been carefully covered with a thick coat of smooth ice; and the dogs were in excellent condition. My companions were M. von Matiuschkin, the retired serjeant Reschetnikow, and the sailor Nechoroschkow. We were joined by a merchant of Kolymsk, named Bereshnoi, who had requested to be allowed to accompany us, on his own account, and in two of his own sledges. The drivers whom I had selected for the travelling sledges were three Cossacks, a Russian peasant, and two Iukahirs. The provision-sledges were driven partly by Cossacks and partly by citizens of Kolymsk, and Iukahirs.

We started on the 26th of March, with a light S.E. breeze, a cloudy sky, and a temperature of

+21°. We slept at the lesser Baranov rock, at the same powarna where we had halted in our first journey. We found here a quantity of drift-wood, and loaded our sledges with as much as they could carry, forming a stock of fuel, which with due frugality, would last twenty-five days. The dip of the needle was here 77° 37′ N.

My instructions directed me to begin our researches at Cape Chelagskoi, but after our recent journey to that Cape, I judged it more advisable, for several reasons, to go at once to the northward, from the Baranov rocks. First, our deposits of provisions, on which the success of the expedition mainly depended, might not have been in safety in the neighbourhood of the Tchuktches; secondly, the immense hummocks which I had seen on that part of the coast, would have presented a formidable obstacle to our progress; and, thirdly, so large a portion of the short remaining season would have been consumed in reaching the Cape, and our dogs would have been so far wearied, that we should probably have accomplished very little towards the true object of our journey.

On the 27th, at 11 A. M., as soon as the mist had cleared away, we took our departure in a due northerly direction. The twenty-two sledges, of which our caravan consisted, formed a line of more than half a werst in length: so that the foremost and the hindmost of the party often lost sight of each other. When we had gone two wersts from the coast, we found ourselves in the midst of a chain of hummocks, about seven wersts in breadth, running parallel with the shore; the hummocks were high and rugged, and the hollows amongst them were filled with loose snow, so that the passage was difficult; and about the middle of

the group we came to a wide fissure in the ice. After three hours labour, we found ourselves on the outside of the chain of hummocks, nine wersts from the shore, on an extensive plain of ice, broken only by a few scattered masses, resembling rocks in the ocean. The hope of being enabled to pursue our way uninterruptedly, made us regard the view, at first, with something of the pleasure which a seaman feels at the sight of the open sea, after passing through intricate channels, amongst dangerous rocks. The dogs quickened their pace of their own accord, as if they shared our feelings. When we had gone eleven wersts further, I halted, to allow them to rest, and to wait for the provision sledges. The dogs had just lain down in the snow, when an enormous white bear made his appearance from behind a hummock, looking as if he meant to attack us; but the loud barking and howling of the dogs soon made him take to flight. The whole party followed in quick pursuit, with guns, spears, bows and arrows. The chase lasted three hours; the bear, after receiving three arrows and two balls in his body, seemed enraged thereby rather than subdued, and turned furiously on the foremost of his pursuers; at that instant another ball, in his breast, turned his rage on a new assailant; the Cossack, who had fired, dexterously received the enraged brute on his lance, directing its point into his mouth, and, with admirable skill and force, succeeded in overthrowing him; the other hunters ran to aid their companion, and the beast was soon despatched; he measured above nine feet from snout to tail, was very fat, and so heavy that twelve good dogs could hardly drag him along. We judged that he must weigh above thirty-five pood.

Whilst this was going on, some of the provision-sledges came up, and the drivers told us that two of their companions had been over-set in a deep cleft among the hummocks, and could not be extricated without more help. I immediately had three sledges emptied, and sent to their aid; and to our great joy the poor men rejoined us two hours afterwards, quite uninjured, though very cold and wet.

The day was now so far spent, and both men and dogs were so wearied by their exertions, that we determined to stay where we were for that night. The tent, before described, formed the centre of the little camp; four smaller tents, or pologi, belonging to the merchant Bereshnoi, and to the richest of our drivers, were pitched near it; and the sledges were drawn up, so as to form an outer circle, within which the dogs were tethered. This arrangement afforded entire security from any unforeseen attack by bears, for they could not approach the camp without being discovered at some distance by the keen scent of the dogs. The weather was beautiful, and we availed ourselves of the bright evening twilight to warm ourselves before lying down to rest, by practising shooting and throwing spears at a mark. A piece of ice was made to represent the bear, certain spots on it were marked as the eyes, the nose, and the heart, and whoever hit one of them obtained a right to join in the next bear-hunt. During these exercises some of the party were engaged in repairing the damages which the sledges had undergone among the hummocks; others in skinning and cutting up the bear which had been killed* and in preparing supper, &c. In doing

* The dogs have a remarkable aversion to bears' flesh, *as long*

this, the greatest frugality was observed in respect to wood; the care of the fuel was intrusted to one of the Cossacks, whose duty it was to see that the least possible quantity was employed in boiling the tea and soup, to extinguish the fire the moment the cooking was over, and to preserve every fragment of wood, or of embers, for the next day's use. We were no less careful in respect to provisions.

On the following day (28th March) the temperature was +5° in the morning, and +10° in the evening. One of our provision-sledges was emptied and sent back. We proceeded in a N. 15° W. direction, and steered our course by some ice-hills which were visible in the distance. We were favoured by a south-easterly wind, and by the smooth surface of the ice. At noon we halted for our daily observations, which gave the latitude 69° 58′. The greater Baranov rock bore S. 73½° E. by compass. We met with numerous traces of stone-foxes, which appeared to have gone in the direction which we were following; this had the good effect of inducing our dogs to quicken their pace. When we had gone forty-eight wersts, we formed our camp for the night in the manner above described. The observed latitude was 70° 12½′. We saw the greater Baranov rock in a S. 56° E. direction, at a distance of about thirty-nine Italian miles. I found the dip of the magnetic needle 78° 15′ N.

We already felt the ill effects on our eyes of the reflection from the snow; the weather had been cloudless, and every one complained more or less of inflammation and acute pain. Some black

as it is warm, and will not touch it even when pressed by hunger; but, when it is cold, they eat it with avidity.

crape, which I had brought for the purpose, was now cut up to cover spectacles and form veils for the whole party, which afforded some protection. The natives applied snuff to their eyes every evening, which increased the pain during the night, but made them better in the morning. We thought this remedy too violent, and contented ourselves with washing the part with spirits, which had the effect of lessening the pain and inflammation.

On the 29th of March, we had a covered sky, and a mild S.E. breeze, with a temperature of + 14° in the morning, and —4° in the evening. We kept the same direction, and found our latitude at noon, 70° 19′; having gone two wersts from this spot, we saw, through the mist, land bearing N. 39° W. and directed our course towards it, with the hope of making a discovery.

In 1769, Lyssiew, Puschkarew, and Leontiew, laid down the position of the Bear Islands, placing the easternmost of them in 71° 58′; according to this the land before us could not belong to that group; its form and size appeared constantly varying; sometimes it looked like high land of considerable extent; sometimes it appeared low; and sometimes it disappeared altogether; so that some of the party were of opinion, that we had only been deceived by one of the optical illusions so common on the polar sea. When we had approached within sixteen wersts of the object of our doubts and hopes, we became convinced that it really was an island, of no great size or elevation, having upon it three pillar-like masses of rock of different heights. Two wersts from the island we had to pass some hummocks. At length we reached a promontory, and discovered behind

it a bay, on the sloping shores of which we were not a little gratified by finding drift-wood. This, and the weariness of our dogs, who had come forty-six wersts, induced us to halt at once for the night. The last provision-sledges did not come up until two hours later.

Whilst our people were pitching the tents and preparing supper, we availed ourselves of the remains of daylight to climb the hill on which the three pillars are situated. From the shore to this point, which is the highest in the island, the ground is covered with fragments of granitic porphyry, gradually increasing in size; the highest pieces lying immediately around the pillars. The pillars themselves consist of horizontal layers of the same rock, five inches in thickness. In two of the pillars there are considerable cracks, running throughout the whole mass from below upwards, and in a N. 60° E. direction, parallel with the outer sides or walls. Hence it may be concluded, that these three masses of stone once formed part of one large rock, and that their separation and present form are due to weathering, or other external causes. We measured the pillars, and found the highest 48.3 feet in height, and 91 feet in circumference near the ground. The form is something like the body of a man, with a sort of cap or turban on his head, but without arms or legs. We saw at the eastern extremity of the island, a fourth pillar-like rock of rather smaller size, and we gave to the island the name of Four Pillar Island. We found near our camp two old wooden sledge-runners, and some rein-deer sinews, showing that the place had been visited by others.

The horizon was covered with mist, and in the

N. N. W. there was an appearance of open water, with floating pieces of ice, but which might have been an optical illusion; and when the sun was set, thick vapours of a dark colour rose from the same quarter. I attributed them to evaporation from the snow mingled with sea-salt. We returned by the west side of the bay, and reached the coast after a walk of five wersts. In the low grounds we found red marshy earth, bearing a scanty growth of low grass, similar to that of the plains on the main land. We saw numerous traces of bears, stone-foxes, and mice, but did not meet with any of these animals. On approaching our little camp, we were greeted by the welcome sight of several blazing fires, round which our companions were pursuing their various occupations with more than usual cheerfulness, and we hastened to share in their enjoyment. On the following day (30th March), we had in the morning a temperature of 0, with a light S. E. breeze, and a clouded sky; and in the evening + 7°. At noon we remarked a halo round the sun's disk.

I determined to halt here for one day, which would also afford an opportunity of sending back two more empty provision-sledges, and of preparing a store of finely broken drift-wood. Whilst M. von Matiuschkin went round the island in a sledge for the purpose of surveying its coast, I was occupied in making various observations. By a meridian altitude of the sun, I found the latitude of our encampment 70° 37′, and its longitude 0° 41′ E. from Sucharnoi; the variation was 14° 6′ E., by corresponding azimuths, and I found the dip 79° 3′, by observations in which the poles of the needle were changed several times. In order also to deduce the dip, I made a series of expe-

riments on the oscillation of the needle, but the results disagreed so much with each other, that I lost all confidence in my Inclinatorium for that particular purpose. The most successful experiment showed, that when the instrument was in the magnetic meridian, the needle made exactly 181 vibrations in five minutes by the chronometer, and that when the instrument was placed in the direction perpendicular to the magnetic meridian, the needle made only 177 vibrations in the same time, which would give a dip of only 75° 30′.

Towards evening M. von Matiuschkin returned, having completed his survey, from which we prepared a map. The substance of his remarks on the formation of the shores was as follows: all the capes and projecting points of land in the island consist, like the above-mentioned four pillars, of perpendicular rocks of granitic porphyry; in the bays, the shores are less steep, and are covered with a thin layer of vegetable earth, in which are many scattered fragments of porphyry. The western part of the island may be considered as a separate rock. It is formed of strata of black slate and whitish quartz containing chalcedony, and is connected with the rest of the island by a low narrow isthmus, which is probably often under water. The rock itself is covered with an immense number of birds' nests. The eastern end of the island is higher and more rocky than the western. In a bay towards the north, there was a much greater quantity of drift-wood than we had found on the southern side. From the western shore, two small islands were visible, but the thick mist prevented their distance being accurately judged of.

The position of this island, its form, its pillars

of rock, and finally the two islets lying to the West and N. W., lead me to believe that our *Four-pillar Island* is the same as that described by Leontiew as the easternmost of the Bear Islands. It is true that he places that island 1° 21′ further to the North, but this difference, great as it is, proves nothing against the identity of the two, for a similar error runs through all his determinations of latitude along the whole of the coast of the continent west of the Kolyma.

We resumed our journey on the 31st of March with a slightly clouded sky and a fresh breeze from the N. E., the thermometer stood at + 7° in the morning and rose in the evening to + 14°, with a strong wind from the E.N.E. We took our departure from the eastern point of the island in a N. 5° E. direction by compass. At noon, when we had gone about 11 wersts, we found our latitude 70° 42′ and our longitude 0° 48′ E. from Sucharnoi. Hitherto we had got on without much difficulty, except in passing the hummocks, but now we came on a surface of ice, which though smooth, was covered with sharp grains of sea-salt, which soon destroyed the ice-coating of our sledge-runners. They no longer glided smoothly along, and we were obliged to relieve the dogs of our weight. The further we advanced, the more difficult our progress became. At every werst we found the snow more soft and damp, and the crust of salt thicker. The wind, which was from the E. N. E., rose more and more, bringing with it a thick fog, so moist, that our fur clothing was soon wet through. All these circumstances indicated the vicinity of open water, and our situation became every moment more hazardous, as the gale continued to increase, and the thick mist which

covered the whole horizon did not permit us to see where we were going. To advance further, therefore, was out of the question; to halt for the night where we were was almost equally so; the snow and ice were both so saturated with salt as to be quite undrinkable, and on this flat surface we had no point of refuge in the not improbable event of the ice being broken up by the storm. Whilst we were in this state of painful uncertainty the mist lightened in the N. 35° E. direction, sufficiently to allow us to perceive some hummocks at the distance of about a werst. We hastened to them, and encamped under the shelter of a thick wall of ice, five fathoms in height, to await a favourable change of weather. Here too the layer of snow, which was about a foot thick, was so mingled with salt, that I thought it probable the ice might not be strong enough to afford us a secure foundation during the approaching storm: I had a hole therefore cut to examine its thickness, and was satisfied on finding that it exceeded 3½ feet. The upper surface of the snow which was lying on the hummocks, supplied us with pure and good water; that which was in immediate contact with the ice had a very salt and most unpleasant flavour. The storm continued to increase, and became extremely violent in the course of the night; our tent was torn by the wind, and might probably have been carried away entirely, if it had not been secured to the hummock by strong fastenings. By our reckoning, the latitude of our sleeping-place was 70° 53′, and its longitude 1° 2′ E. from Sucharnoi. At four in the morning the storm subsided, and we put ourselves in motion in a N. 10° E. direction; there was still a thin mist, and the air was mild, the

thermometer stood at + 23°. In the evening the sky cleared and the temperature was + 7°. Our noon observation gave 70° 54′ latitude, and our longitude by reckoning was 1° 8′ E. from Sucharnoi. When we had gone 24 wersts further, we saw tracks of stone-foxes on the snow going in a N. W. direction: the horizon in that quarter was veiled by a dark blue mist, which as our companions told us, usually indicates open water. We saw hummocks which contained earth and sand. We had bound pieces of whalebone under our wooden sledge-runners, and we found that they greatly facilitated our progress over the damp snow and sea-salt. Still we were obliged to walk, and it took seven hours to accomplish thirty-three wersts, notwithstanding which our provision-sledges were so far behind, that we had lost sight of them. We therefore halted, and passed a more quiet night than the preceding. The evening and morning twilight had now melted into one.

On the morning of the following day (2nd April) a N.W. wind brought snow: the temperature was + 18°. Our course was N. 10° W. We made our way with great difficulty among hummocks of ice, and had to use our utmost efforts to drag the sledges across wide strips covered with large crystals of salt. About 14 wersts from our sleeping-place we came in sight of three seals, which were sleeping carelessly on the ice; the dogs rushed towards them, but they made good their retreat and disappeared under the ice. On coming to the spot we found a round hole of a foot and a half in diameter. The ice here was rather more than a foot in thickness, very rotten, and full of salt. We sounded and

found twelve fathoms, with a bottom of soft green mud. The line of hummocks through which we had passed ran due east and west; there were others in the same direction about four wersts to the north of the seals' airhole: we passed over a strip three or four wersts in breadth, where the snow was deeper and free from salt. After making thirty-four wersts in a northerly direction, we encamped for the night under the shelter of a large hummock. By our reckoning, our latitude was 71° 31′, and our longitude 1° 37′ E. from Sucharnoi.

We felt a good deal exhausted by the efforts which the state of the snow had rendered necessary, and by the unwonted mildness of the weather. We determined therefore, to rest by day, and to travel only during the night, when the air was colder, and when we should not suffer so much from the dazzling effect of the snow, whilst at the same time we should enjoy uninterrupted twilight. On the third of April, I sent back three more empty provision-sledges, giving them a compass to aid them in their homeward course. The noon observations gave the latitude 71° 32′. The weather was overcast with a light breeze from the north; the thermometer at + 16° and damp snow fell at night.

We broke up after sunset, and noticed a number of tracks of stone-foxes going from W.S.W. to E.N.E. At first we got on pretty rapidly, notwithstanding occasional salt patches, but these gradually increased until we had gone about fifteen wersts, when we found ourselves in what may be called a deep salt moor, where it was impossible to advance. I examined the ice beneath the brine, and found it only five inches

thick, and so rotten that it was easily cut through with a common knife. We hastened to quit a place so fraught with danger, and after going four wersts in a S. by E. direction, we reached a smooth surface covered with a compact crust of snow. When we had gone a couple of wersts over this, I had the ice examined, and found it one foot two inches thick. The depth of the sea was twelve fathoms, and the bottom greenish mud. We halted one or two wersts further on, near some inconsiderable hummocks, where the thickness of the crust of ice and the depth of water were examined, and found the same as before. The water gushed up through the holes which had been made in the ice, and overflowed to a considerable distance in all directions, and soon imparted its bitter salt taste to the snow. When the watery particles evaporate in the sun, they leave behind a thick brine, part of which forms crystals and part contributes to destroy the ice.

Meanwhile the north wind increased in strength, and must have raised a considerable sea in the open water, as we heard the sound of the agitated element beneath, and felt the undulatory motion of the thin crust of ice. Our position was at least an anxious one; the more so, as we could take no step to avoid the impending danger. I believe few of our party slept, except the dogs, who alone were unconscious of the great probability of the ice being broken up by the force of the waves. Our latitude was 71° 37′, and our longitude 1° 45′ E. from Sucharnoi. In the morning we had a clouded sky, damp snow, and a temperature of + 16° with a gale from the north: in the evening the wind moderated and shifted to N. E., the sky cleared and the thermometer showed + 9°.

As soon as the wind fell and the weather cleared, I had two of the best sledges emptied, and placed in them provisions for twenty-four hours, with the boat and oars, some poles and boards, and proceeded northwards, to examine the state of the ice: directing M. von Matiuschkin, in case of danger, to retire with the whole party as far as might be needful, without awaiting my return.

After driving through the thick brine with much difficulty for seven wersts, we came to a number of large fissures, which we passed with some trouble by the aid of the boards which we had brought with us. The ice was heaped up in several places in little mounds or hillocks, which at the slightest touch sunk into a kind of slough. This rotten ice was hardly a foot thick; the sea was twelve fathoms deep, the ground green mud; the countless fissures in every direction through which the sea-water came up mixed with a quantity of earth and mud, the little hillocks above described and the water streaming amongst them, all gave to the field of ice the appearance of a great morass, over which we contrived to advance two wersts further to the north, crossing the narrower fissures, and going round the larger ones. At last they became so numerous and so wide, that it was hard to say whether the sea beneath us was really still covered by a connected coat of ice, or only by a number of detached floating fragments, having everywhere two or more feet of water between them. A single gust of wind would have been sufficient to drive these fragments against each other, and being already thoroughly saturated with water, they would have sunk in a few minutes, leaving nothing but sea on

the spot where we were standing. It was manifestly useless to attempt going further; we hastened to rejoin our companions, and to seek with them a place of greater security. Our most northern latitude was 71° 43′; we were at a distance of 215 wersts in a straight line from the lesser Baranov rock.

During my absence M. von Matiuschkin had observed the magnetic dip, and had found it 79° 51′. I immediately gave the order to break up and to take a S. S. E. course.

Before proceeding further with my narrative, I must mention the remarkable skill with which our sledge-drivers preserved the direction of their course, either when winding amongst large hummocks, or on the open unvaried field of snow, where there were no objects to direct the eye. They appeared to be guided by a kind of unerring instinct. This was especially the case with my Cossack driver, Sotnik Tatarinow, who had had great practice for many years. In the midst of the intricate labyrinths of ice, turning sometimes to the right and sometimes to the left, now winding round a large hummock, now crossing over a smaller one, among all the incessant changes of direction, he seemed to have a plan of them all in his memory, and to make them compensate each other, so that we never lost our main direction; and whilst I was watching the different turns, compass in hand, trying to resume the route, he had always a perfect knowledge of it empirically. His estimation of the distances we had passed over reduced to a straight line, generally agreed with my determinations deduced from observed latitudes and the day's course. It was less difficult to preserve the true direction on a plain surface.

To enable us to follow as straight a line as possible, we tried to fix our eyes on some remarkable piece of ice at a distance; if there was none such, we were guided by the wave-like stripes of snow (sastrugi) which are formed, either on the plains on land or on the level ice of the sea, by any wind of long continuance. These ridges always indicate the quarter from which the prevailing winds blow. The inhabitants of the Tundras often travel to a settlement several hundred wersts off, with no other guide through these unvaried wastes than the sastrugi. They know by experience at what angle they must cross the greater and the lesser waves of snow in order to arrive at their destination, and they never fail. It often happens that the *true* permanent sastruga has been obliterated by another produced by temporary winds, but the traveller is not deceived thereby, his practised eye detects the change, he carefully removes the recently drifted snow, and corrects his course by the lower sastruga and by the angle formed by the two. We availed ourselves of them on the level ice of the sea, for the compass cannot well be used whilst driving; it is necessary to halt in order to consult it, and this loses time. Where there were no sastrugi, we had recourse to the sun or stars when the weather was clear, but we always consulted the compass at least once in every hour.

When we had gone 20 wersts, the hummocks increased both in size and numbers: at first the ice was only uneven; next we met with a quantity of pieces of various sizes, gradually increasing until they formed whole ranges of hummocks, often of 80 feet high. These great masses of ice were all of a greenish-blue colour, and had a

strong salt taste. The difficulty of working our way among them was much augmented by the loose snow which lay between, concealing a quantity of sharp fragments of ice which often overturned our sledges, and gave us many a painful bruise. These hummocks, which differed from all those we had before seen, were what are called winter hummocks. They had been formed during the last winter as well as in the preceding spring and autumn, when the ice of the sea, being broken by violent storms, is heaped up and cemented together by strong frost. On getting clear of these sharp-pointed winter hummocks, we came upon another group of a totally different aspect. It consisted party of conical hills, varying in height* and size, and sometimes having long or round valleys between them. As we saw no detached masses of ice, we at first thought ourselves on a hilly island, but on examination it proved to be nothing but snow and ice in a somewhat different form. In the hollows and on the summits of the hills we found the surface of the ice perfectly bare. It was smooth and even, its colour passing from whitish grey into black; it had a perfectly pure taste, and was large-grained and opaque: the sides of the hills were clothed with snow, and afforded excellent travelling. When we had gone two wersts, we found ourselves in a small circular hollow, completely sheltered from every wind, where we formed our encampment.

On the 5th of April, the sky was clear with a strong breeze from the S.S.E., and a temperature of + 9° in the morning, and + 7° in the evening.

* We measured the height of some of the largest, and found it ninety feet.

Our noon observation gave the latitude 70° 30′, and the longitude 1° 55′ E. from Sucharnoi. After sunset we resumed our march in an easterly direction, but at the end of three wersts we found ourselves amongst almost impassable winter hummocks, which appeared to have been formed on and around others, consisting of the solid ice above described. We saw at some distance a high black summit, so closely resembling a rock, that I determined to go to it in spite of every difficulty. It cost us three hours, during which we had to break our way with crow-bars for about 300 fathoms. We found it was only an ice-hill formed entirely of the solid ice above described. We had an extensive view from its summit. To the north and east we saw impenetrable winter hummocks, and a number of lanes of open water. To the S.E. the surface was more even, and less interrupted by fissures.

The provision sledges had been so much injured that it was plain they could not hold together much longer, and the dogs belonging to them were exhausted by hard work. I determined, therefore, to form a deposit of provision in this place, and to send back the empty sledges. We excavated in the iceberg a kind of cellar five feet deep, and a fathom across; in this we packed our stores, and closed the hole with the fire-wood which was to be left, and with well-trampled snow to guard against the visits of the white bears. I sent the eight empty sledges back to Nijnei Kolymsk, with their drivers, who had for some time despaired of seeing their homes again, and were so delighted at the prospect of a speedy return, that they soon completed the necessary preparations, and were ready to start before sun-

rise. I gave them a compass, and Serjeant Reschetnikow took the command of the party. The merchant Bereshnoi remained with our division, which now consisted of ten persons with six sledges, and provisions for fourteen days.

On the 6th of April, the temperature was + 18° in the morning, with the S.E. wind, and —2° in the evening. Throughout the night we frequently heard the noise of fresh clefts opening in the ice around us, and a hollow rumbling sound, resembling the rolling of distant thunder. A chain of high winter hummocks to the S.E. appeared to form the southern boundary of the recent openings in the ice, which were every where visible to north and east. From these hummocks we saw many other ice-hills to the south, but no spaces of open water. We followed a tolerably smooth narrow path along the south side of the ridge of hummocks, seeking an opportunity of penetrating to the north. The ridge was about a hundred feet high; to our right we had a plain, thickly strewed with blocks of ice mixed with a quantity of loose deep snow, and we inferred from this accumulation of winter snow, that they were autumn hummocks, and had been since undisturbed. The ridge on our left had evidently been formed only a few days, and belonged therefore to the class of spring hummocks. An examination of the recent fracture, and of the occasional clefts by which it was intersected, led me to infer that it had been formed in the following manner:— The sea to the north of us, had been covered during the winter by smooth ice, and compact snow. In spring the ice had broken up, partly into an extensive field, and partly into smaller pieces, which had been subsequently forced be-

neath the field, and had gradually raised it into an oblique position. This would account for the smooth and sloping declivity on the south-western side, and for the perpendicular, rugged, and fragmentary formation on the north-eastern side. On the top of the ridge, we noticed fragments of ice of various sizes, apparently so insecurely supported, that we wondered how they could retain their position. One block in particular, which could hardly be less than 1000 cubic feet, rested on a fragment of not more than eight cubic feet.

On the southern declivity was a horizontal cleft rather more than a foot broad, which gave me an opportunity of examining in some degree the internal formation; and, I found to my great surprise that the upper slab or stratum of ice, which was in this place eleven feet thick, had split into layers of rather less than two feet in thickness. We passed several spots of water and found in sounding twelve fathoms with mud as before. Having gone twenty-nine wersts along the foot of the ridge which ran S. 60 °E. without finding any opening towards the north, we pitched our tent 300 fathoms from a recent cleft, and near a large fragment of ice. A strong breeze prevailed from the east; the ice beneath us was agitated more or less the whole time we rested; and in the N.E. quarter there was a loud noise of the crushing together of the masses of ice. Our noon observations gave 71° 15′ latitude, and our longitude by reckoning was 2° 20′ E. from Sucharnoi.

On the 7th of April the weather was clear, with a strong breeze from the east, the thermometer stood at + 5° in the morning and —6° in the evening. We continued our route in a S.E. direc-

tion along the margin of the recent crack, the ridge of ice becoming lower and less regular or continuous, and the fissures more and more numerous; we sounded thirty wersts from our halting place, and found twelve fathoms; the ground as before. After going forty-nine wersts, we halted at sunrise in latitude 70° 56′, our longitude by reckoning being 3° 5′ E. from Sucharnoi.

On the evening of the 8th, heavy clouds came up from the south, and the temperature sunk from + 18° to Zero. When we had gone ten wersts we came to a wide fissure, across which we ferried ourselves by the aid of a floating block of ice. We tried the current, and found it setting ½ a knot in an E. S. E. direction: soundings 12½ fathoms. Twenty-two wersts further on, we saw in the horizon in a direction S. 2° E. the greater Baranov rock, which by our reckoning should have borne S. 3° W. distant 114 wersts. Whilst we were discussing this difference, we saw the fresh track of a bear, and gave chase, M. von Matiuschkin and myself in two sledges which we had emptied for the purpose. We had followed the track for a few wersts when our whole attention was engaged by a distant noise, which seemed rapidly approaching and soon equalled a loud clap of thunder. At the same time the ice beneath was violently agitated, and began to open in various directions. We thought no more of the bear, but hastened to rejoin our companions. As we were returning, one of our best dogs had a narrow escape. He had been set at liberty to pursue the bear, and had run to some distance; when he returned, his white colour made the Cossacks mistake him for a bear, and one of them had actually levelled his gun ere the mistake was discovered.

As the breaking up of the ice had not extended to the spot where we had left our companions, and as our dogs were tired, we halted for the night; the latitude was 70° 46′, and the longitude 3° 22′ E. of Sucharnoi. Next morning, the 9th of April, we continued our course in a S. E. direction, until fissures, open water, and impassable hummocks, finally baffled all our efforts, and with broken sledges we had to retrace our steps to the last halting-place. The 10th was Easter-day, kept as a festival throughout the whole Christian world, but especially so in Russia. We joined in the prayers of our far-distant friends by the prescribed service, which was read by M. Bereshnoi, and the hymns were sung by our Cossacks and sledge-drivers. A block of ice was carved to represent an altar, and the only wax-light we possessed was burnt in front of it. The day was one of rest and refreshment to all; our festive-fare was frugal enough; we had reserved for it a few reindeer's tongues, and a little brandy; a much greater treat was a small fire, kept up during great part of the day.

On the 11th, the dogs being rested as well as ourselves, we were about to start, when one of the drivers was taken suddenly ill with violent pains in the back, which made motion insupportable to him throughout the day. We made some use of the delay, by repairing our sledges. The temperature was from + 18° to + 12°. We frequently heard in the distance, the sound resembling thunder, which is occasioned by the crashing of the ice.

The constantly multiplying obstacles in the direction which we had desired to pursue, and the slender hopes that could be entertained of

surmounting them, in the weakened state of our dogs, induced me, after much consideration, to determine on returning to our deposit of provisions, of the safety of which our drivers had, for some time, entertained doubts. Taking a due west course we soon came to smooth ice and hard snow, which enabled us to accomplish sixty-four wersts before we halted. Four Pillar Island, which by our reckoning was thirty-eight wersts from us, was just visible on the horizon, in the direction S. 62° W. The noon observations gave the latitude of our encampment 70° 39′, and the longitude 1° 45′ E.

On the next day we turned to the north, and came on the track left by the returning provision-sledges, which we followed across some hummocks. After accomplishing fifty wersts we halted in latitude 71° 4′.

On the 14th of April we came on numerous fresh tracks of bears and stone-foxes, which made us very apprehensive for the fate of our store. I followed the tracks to the N.E., with three of the lightest sledges, and soon came on a deserted bear's den, a fathom deep in the snow, with two narrow entrances opposite to each other, and with just room enough to contain two bears. In the neighbourhood was a seal's hole, having on one side a raised bank of snow, through the lower part of which there was a small opening towards the ice-hole. The bears often throw up this sort of parapet close to a seal's hole, and lie in wait behind it: as soon as the seal creeps out from under the ice, he is caught by the powerful paw of the bear thrust through the opening, which at one pull draws him away from his only place of refuge, and he is then soon despatched. The

boldness and dexterity of the stone-fox in venturing close to the bear, and carrying off part of the booty, are very remarkable. He is truly the bear's guest, and one generally finds the tracks of the two animals together. We now came on our own old track, which we determined to pursue until it should conduct us to our deposit; and I sent back one of the sledges to tell the rest of our companions to meet us there. We found that our former path was in great measure broken up. Hummocks had sunk, and large fissures and lanes had opened since we travelled it. These we were obliged, with much labour, either to cross or to go round. At one place my eight dogs fell into the water, and must have dragged the sledge after them, but for its great length, which saved us. After eleven hours of dangerous and difficult travelling, we reached our deposit, and to our great joy found it unmolested; we saw numerous traces of bears on every side, but they had happily not ascended the iceberg. We were soon rejoined by our companions, and passed the next day in resting the dogs and repairing the sledges. The temperature was + 7° in the morning with a north wind, and + 19° in the evening with a west wind. Our noon observation gave the latitude 71° 28′. In the night we were awakened by the sudden and violent barking of the dogs, which told of the approach of a bear. As we never undressed, we were soon on our feet, and saw two unusually large bears, which were immediately pursued; in our first eagerness we missed our aim, the bears fled unhurt in different directions, and the hunters scattered themselves in somewhat disorderly pursuit. In vain I tried to recall them; they either did not hear me, or forgot dis-

cipline in the mortification of seeing their prey escape. I was left alone among some hummocks, and climbed one of them in the hope of getting sight of the hunters, but I could see no one except M. Bereshnoi and my driver Tatarinow, who were standing together at some distance from me, the former armed with a gun, and the latter with a bow and a lance. A third bear appeared suddenly from behind a hummock, looked at me intently for a few moments, and then turned in the direction in which his companions had fled, and seemed inclined to follow them, but on catching sight of the two men who were standing below, he made boldly towards them. As they had but one charge, their situation was somewhat precarious; but Tatarinow, trusting to his skill, allowed the bear to come within three fathoms, and then shot and wounded him in the shoulder; the beast fled foaming and bleeding, and we lost sight of him among the masses of ice. The hunters did not return till morning, when two of their number were still missing and did not come in till two hours later, and then so exhausted, that if the bears had attacked them they must have fallen an easy prey. So ended this unfortunate chase, the only result of which was to weary both men and dogs to such a degree, that I was obliged to stay another day.

On the 17th of April the day was overcast, with a light breeze from the east, and a temperature of + 21° in the morning, and + 16° in the evening, with fine snow. There were three halos round the sun. After going nine wersts in a westerly course, we crossed our track of the 1st of April: we now left the hummocks behind, and came on a flat track covered with damp snow;

however our whalebone runners glided freely along, and we accomplished forty-one wersts before halting, in lat. 71° 26′ and long. 0° 43′ E. from Sucharnoi. Next day the temperature was —4° in the morning, with a fresh breeze from the east, and + 5° in the evening.

As we had now arrived at a part of the sea which had been visited by M. Hedenstrom, in 1810, I thought it useless to proceed further in this direction, and directed my course to the south, to survey the islands which we had seen from Four Pillar Island, in the meridian of which we now were. On this day (18th of April) we made forty-two wersts, notwithstanding the violence of the wind, against which the dogs could sometimes hardly stand. There was, at the same time, so thick a snow-storm, that the persons in the hindmost sledges could not see the leading ones, and were in danger of missing the track, which was every moment effaced by fresh snow. We therefore tied the sledges together in pairs, and fastened the leading dogs of each team to the preceding sledge. We drove in this manner the whole day, unable to see our way, and guided solely by the compass. Finding no sheltering hummock, we were forced to halt at last on the open ice plain. This night was, doubtless, one of the most uncomfortable of our journey. We were exposed to the whole fury of the storm, unable either to pitch our tent or light a fire, with a temperature of + 7°, without tea or soup, and with nothing to quench our thirst, or satisfy our hunger, but a few mouthfuls of snow, a little rye-biscuit, and half-spoilt fish. We were most glad next morning, to resume our journey, but we had first to extricate ourselves and sledges out of the

snow, as well as the dogs, which were still more deeply buried. Our course was southerly, and we proceeded with tolerable rapidity, but as the dark weather and driving snow still continued, we were not without fear that we might miss Four Pillar Island. However, I had the great satisfaction of finding that the accuracy of our reckoning had been such, that after travelling fifty-two wersts, our course led us straight to a bay on the north side of the island, which we were unable to discern, until we were within five wersts of it. After the difficulties through which we had passed, this bay was a welcome haven. We pitched our tent on *terra firma*, under the shelter of a high cliff, and which was better still, we found an abundance of drift-wood, with which we soon made two capital fires, one for warming ourselves and cooking, and the other for drying our wet clothes, which we had been unable to do for some time; and as we luxuriated in the full enjoyment of the fire, and drank our boiling-hot, though somewhat meagre soup, and refreshing tea, we soon forgot all previous discomforts. Nothing disturbed our satisfaction, save the thought that our efforts had not been rewarded by the discovery of the supposed land of which we had been in search.

Next morning we felt quite refreshed, and proceeded N. 65° W., towards the islands we had seen on the previous occasion. The temperature was + 9°. On arriving at the first island we were most unexpectedly greeted by the notes of some linnets, the harbingers of spring, and the first cheerful sounds which we had heard since we began our ice journey; it is impossible to describe the pleasure they produced.

In order to complete the survey of this group

of islands more quickly, we divided the work. M. von Matiuschkin went to the south, and I to the north: we met at night at the north point of the Middle Island, after surveying three islands, which lie in the direction of the meridian. We halted here the whole of the next day in consequence of the thickly-drifting snow. On the 23rd the weather still continued very bad, but as the drift was a little less thick, we proceeded to survey the westernmost island.

Our chart of the Bear Islands will show their configuration far better than any description could do; and I will, therefore, only briefly mention a few remarks which we made during the survey.

The first Bear Island, Krestowoi, is the highest and largest of the group. It is distinguished from the rest by two mountains, the southernmost of which has a rounded summit, and is about the centre of the island. The east and north coasts are steep and partly rocky. On the south side, where the shore is more sloping, a stream falls into the sea; the sloping shore on the west side is formed of gravel. We found drift-wood in a small bay near the north-western point of the island. It consists here, as elsewhere in this group, chiefly of larch, mixed with a few poplars, but with scarcely any firs. From the number of dens and burrows, this island would appear to be visited by a great number of stone-foxes, wolves, and bears, and to be inhabited by a quantity of field mice. On the southern side, we saw a few rein-deer; our encampment was in latitude 70° 52′, and the longitude trigonometrically deduced, is 1° 21′ W. from' Sucharnoi.

The second island, which is little more than a mass of fragments of granite, is about 200 fathoms

long, and 150 fathoms broad; we found here only a few decayed trunks of larch-trees. This little island is not marked in Leontieu's chart; it was probably concealed by masses of ice, which still surround it on every side.

The third island is itself high, but has no hills; there are a few rocks on the south side, and more on the east and west, where they run out some distance to sea. The shore is shelving in the bays.

Near the east point of the island there was a kind of cellar dug in the earth, and supported by posts, but we could not examine the interior, as it would have taken us too long to clear out the snow. We found on the beach a very old oar, of the kind which the Iukahirs use in their wetkas;* we also saw some rein-deer sinews, and some human bones, but we could not find a skull.

On the fourth island, there are two long high ridges, running parallel to each other in a N.N.W. and E.S.E. direction, connected by a cross ridge. Where the surface was clear of snow, it appeared to consist of a thin layer of gravel and vegetable earth, covered with fragments of the same rock as that which forms the pillars in the sixth island already described. The cliffs on the northern shore are also of the same rock. The southern shore consists of steep earth hills, with a quantity of Mammoth bones. By our observations, the

* Wetka is the name of a light, long, narrow boat, formed of three boards, used principally for rein-deer hunting. Usually only one man sits in these boats, with a single oar having a paddle at each end, which he uses alternately right and left. The wetkas are very rapid, and so light that they can easily be drawn from one lake or river to another. Sometimes two men get into the same wetka, which in such case can contain nothing else.

north point of this island is in 70° 47′. The variation of the needle was 14° 00′ east.

The fifth island is tolerably high, with cliffs of the same rock as that which forms the western point of the sixth island. Here were some indications of sulphur.

The sixth, or Four Pillar Island, has been already described.

During our halt of the 23rd, one of our drivers, in the boasting spirit common amongst these people, assured us that he had been, many years ago, on the first Bear Island, which he said was visible from the mouth of the Krestowaia River, from which it had been named; he further said, that this island was small, circular, and not at all like the one on which we now were.

Notwithstanding this positive assertion, we certainly were on the island marked by Leontieu as the island Krestowoi, nor can there well be any other island further to the west yet unobserved. The state of the weather prevented our discerning any distant objects at this time, but during M. Kosmin's survey of the coast of the main-land in the following summer, the incorrectness of our driver's statement was clearly proved. M. Kosmin saw, from a cape near the river Krestowaia, an island, to which his guides gave the name of Krestowoi Ostrow. Its appearance was that of a round hill of moderate size. From the angles which he took, it was evident that this hill was not on the nearest island, but on one behind it, which accords with our survey.

In order to obtain more entire conviction on the subject, I commissioned M. Kosmin, in the winter of 1823, to examine that part of the sea which intervened between our course and that of

M. Hedenstrom in 1810. M. Kosmin left Nijnei Kolymsk on the 30th of January, with two sledges and provisions for fourteen days. On the 5th of February, with a temperature of —31°, they went upon the ice of the sea, from the mouth of the river Agafonowka, and before night reached the island which M. Kosmin had seen in the summer, and which we had surveyed. On the following days he proceeded further north, until, on the 9th of February, he reached latitude 71° 58′, without having met with any considerable hummocks or any places overflowed by salt water. But though unimpeded by these obstacles, the travellers suffered severely from cold, which during the last two days of their return increased from —35½° to —40°, and the dogs were lamed by the joint effect of the cold and the hardness of the snow. He returned by the Middle Bear Island, and took the most direct way back to Kolymsk, where he arrived on the 17th of February. This expedition shows the assertion of the sledge-driver to be without foundation, and fully confirms the correctness of our observations respecting the island Krestowoi and the Bear Islands generally. I have therefore restored the name of Krestowoi to the first of the Bear Islands, or that which is nearest to the continent, and have distinguished the other islands of the group according to their distance from the first, as second, third, &c., so that our Four Pillar Island is the sixth.

After this little digression from the chronological order, made in order to bring together everything relating to this group of islands, I return to our journey.

Though I had not much confidence in the driver's story, I would not omit anything which

could be done towards investigating the subject, and I therefore decided to look for the island in question by taking a S.S.W. ½ W. direction towards the Cape Krestowoi of Leontieu's map. The E.N.E. wind rose gradually, but as it was in our backs, and the snow was smooth, we had soon gone over 44 wersts, notwithstanding the drifting snow, when we suddenly perceived that we were no longer on the ice but on land. At first we thought we had reached the island which we were seeking, but in a few minutes we heard an exclamation from one of our drivers, who had found a fox-trap bearing his own mark, whereby he knew that we were on the main-land, not far from the river Agafonowka. He conducted us, notwithstanding the thick drift, to a balagan at the mouth of the river, where we had once more the comfort of a roof and walls. Our provisions being now expended, and the season far advanced, we determined to return home by the shortest way. I would gladly have taken the opportunity of laying down this part of the coast, but the state of the weather made it impossible. The wind was from the N.E. becoming more and more violent, and the atmosphere was completely darkened by the driving snow. We abandoned ourselves entirely to the guidance of our drivers, who were thoroughly well acquainted with the district. They brought us, on the 25th of April, to a powarna near the mouth of the greater Tchukotkia, where the shore forms a high cape.

On the 26th we crossed the hills to a river called Iakutskaia Wiska, a distance of 24 wersts, and after driving six wersts further across a tundra, we came to the Iakuts lake, where one of our drivers had a store of fish from which he

entertained us. The fish were preserved in a kind of cellar hewn out of the ice of the lake; the opening had been closed with ice and snow, over which water had been poured, so that the surface of the lake showed no traces of the store beneath, and it was perfectly inaccessible to bears. Whilst we were busied in opening and reclosing the ice-cellar, a large herd of rein-deer ran by at no great distance. The sight of them had nearly cost us dear, for our dogs all set off in pursuit, and we had great difficulty in recalling them. We slept at a balagan, 30 wersts further on.

On the 27th of April the weather changed, the snow ceased, and we had a cutting S.W. wind, with a temperature of —2°. We came on a beaten track which conducted us across a lake to a village on the lesser Tchukotskia. This place, which consists of fifteen old huts and a ruined barrack, is deserted in winter, but is resorted to in summer for fishing, by the inhabitants of the village of Pochodsk, fifty wersts distant, and which we reached late in the night. Poor as this settlement is, its aspect filled us with pleasurable sensations; we saw a few places among the huts where the spring sun had melted the snow, and where brown earth was visible; smoking chimneys and the faint glimmer of lamps through the ice-windows, told us that we were again amongst human beings. The barking of the dogs announced our arrival, and from every door we heard the grateful sound of the Russian "welcome." We were soon seated, surrounded by kind faces, near a stove in a warm room, where we could throw off our frozen furs, and really rest from the toils and privations of the icy desert. Our good hosts soon placed before

us the best entertainment their poverty could furnish; amongst other things they gave us some fresh-killed ptarmigan in our soup: in the enjoyment of comforts to which we had been long unaccustomed, and in friendly conversation, the hours passed rapidly away.

On the next day we continued our journey, and arrived at Nijnei Kolymsk on the 28th of April, after an absence of 36 days, during which we had travelled 1210 wersts with the same dogs.

CHAPTER VIII.

Nijnei Kolymsk.— Spring.—Scarcity.—Fisheries for the supply of the Expedition.—Building a Shallop.—Plans for the Summer.—Warm Weather.—Musquitoes.—Embark in the new boat.—Accident to M. von Matiuschkin.—Rein-deer hunting in the Tundra.—Arrival at Tchukotskia.—Departure of M. Kosmin to survey the Coast as far as the Indigirka.—Return up the Kolyma.—Tent burnt.—Arrival at Nijnei Kolymsk.—Visit to the Iakuts of Sredne Kolymsk.—Their Summer Life and Habitations.—Traditions.—Albuty.—Early snow.—Return to Nijnei Kolymsk.—Arrival of MM. Matiuschkin, Kyber, and Kosmin.

On arriving at Nijnei Kolymsk, we found that spring had already brought its accustomed scarcity, with the consequent train of suffering and disease. As soon as the ice of the river began to melt, the whole population dispersed to their summer habitations on the banks of the different rivers in pursuit of fish and game. The experience of the past year had taught us that we could not rely for supplies for the expedition on the natives, who make but inadequate provision for their own wants, and that it would be necessary to depend on our own exertions. I therefore hastened to send people with nets and

baskets to the most favourable fishing-places, before the sledging season was quite over: and fixed on the lesser Tchukotskia as the head-quarters of our several parties, being a very productive river, and less frequented than most others. Tatarinow was charged with the general superintendence of our fisheries, and I felt secure that we should obtain a sufficient supply.

My next care was how best to employ the short summer: I decided that one division should proceed on horseback, to survey the coast between the Kolyma and the Indigirka, and that another division in boats should make an accurate survey of the several mouths of the Kolyma. A small dwelling and a magazine for provisions were to be erected at the mouth of the great Baranika, for the use of our winter expedition. Lastly, Dr. Kyber, who had now recovered from his illness, undertook, by his own desire, to examine the country on the banks of the greater and the lesser Aniui.

It may seem strange that we should have proposed to make a coast survey on horseback, rather than with rein-deer or in boats: but a full consideration of the subject convinced me that rein-deer would not be equal, particularly in summer, to such long days' journeys as we should require to make, whilst they would be also more expensive than horses; and that boats would not answer, on account of the extensive shallows and sand-banks which prevent a near approach to the shore; moreover, that any small vessel would run great risk of destruction from the large pieces of ice which are always drifting along the coast. We agreed with the Iakuts of Sredne Kolymsk for a sufficient number of horses, and for trustworthy guides acquainted with the country. I intrusted the coast-survey to

M. von Matiuschkin, and undertook that of Kolyma myself. I further availed myself of a journey, which our travelling companion M. Bereshnoi was about to make on horseback to the eastern Tundra, to search for mammoth bones,* to send with him Serjeant Reschetmikow, with a good carpenter and two assistants to build a large powarna and a store-house of drift-wood, at a convenient spot near the Baranika river.

During our absence in the second journey over the ice, M. Kosmin had been engaged in the construction of a large boat or shallop, which he had brought to a successful conclusion in spite of the deficiencies of all kinds under which he laboured. He had fortunately found under the snow a sufficient quantity of knee-timber for the frame-work, and after the scaffolding was erected, and the artificers understood their instructions, the work proceeded so rapidly, that in May a vessel was completed, of excellent construction in all its parts.

On the 25th of May the ice of the river broke up, and on the following night the first shower of rain fell; the banks and sunny slopes began to be covered with grass; the willows opened their buds and put forth young leaves, and the short summer advanced rapidly; the temperature increased to $+55°$ and even to $+68°$: the progress of vegetation was sensible to the eye, but the enjoyment we felt in re-

* Throughout Siberia, but more especially in the northern and north-eastern parts, mammoth bones and tusks (or, as they are there called, *horns*) are found in clay hills, in the tundras, and along the banks of rivers. The best season for searching for these antediluvian remains, is in spring, when the streams, swollen by the melting snows, overflow their banks and undermine the hills. The inhabitants resort at this season to those localities which are known to be productive. Very long journeys are often taken with this view, and usually with good success.

turning spring was of short duration. The 4th of June brought as usual immense swarms of mosquitoes, whose insufferable bites obliged us to take refuge in the house, and to keep up in front of the doors and windows a constant smoke, which choked us, and made our eyes ache. We greatly rejoiced, therefore, when on the 9th of June a strong north wind suddenly lowered the temperature from + 59° to + 38°, and drove away our tormentors. We could now enjoy the delight of breathing the air of heaven without being frozen; we roamed with our guns over the country, and seldom returned home till late in the evening, loaded with wild-fowl. The first birds of passage had been seen on the 29th of April, but now large flights were continually passing to the northward, and alighting occasionally on the grassy slopes, where great numbers were killed.

We were not able to launch our shallop, which we named the *Kolyma*, until the 11th of June, when the inundation subsided. The sails were made out of the canvas belonging to the sails of Captain Billings' ships, and the anchor was forged by ourselves from remnants of iron belonging to the same expedition. We had built besides a small boat for passing shallows. It was on the pattern of the country wetkas, but was larger, and could carry three men.

All our preparations being completed, our whole party embarked together. Dr. Kyber was to leave us at the first village, and MM. Matiuschkin and Kosmin at the lesser Tchukotski river, where the horses were to meet them, and where they were to begin their survey. We had four oars, and the current in our favour, but as it was only $\frac{5}{4}$ of a knot an hour, and the wind was blowing fresh and

dead against us, we were obliged to stop after going five miles.

Mortified as we were at this detention, we had soon to regret a more serious disaster, which our companions viewed as a most evil omen, and which obliged us to alter materially our plans for the summer. As we were about to land, one of our dogs, in jumping from the boat to swim on shore, became entangled in a loose rope, and would inevitably have been strangled, if M. von Matiuschkin had not sprung to his aid; unfortunately, that gentleman (in his eagerness to release our faithful follower by cutting the rope,) cut off at the same time a large piece of his own thumb. The wound was a bad one, and Dr. Kyber was of opinion that it might easily become dangerous. I therefore sent the docter and his patient in the boat back to Nijnei Kolymsk, to wait there until the wound should be healed, which Dr. Kyber considered would require a month, and it was also arranged that they were then to travel together up the Aniui.

As soon as the boat returned, M. Kosmin and I continued our voyage, and arrived on the 28th of June at the lesser Tchukotski river. We visited by the way the villages of Tschernoussow and Pochodsk, to inquire after the fisheries. They had been successful, and we saw large quantities of fish drying on scaffolds round every house. Great numbers are taken at this season in descending the stream. The fishery is usually conducted by the whole of the little community uniting to erect a dam across the river, leaving an opening in the middle, in which the baskets are placed. The produce is divided according to certain rules. After the dam has been erected, the rest of the work is so light, that the men

usually leave it to be attended to by the women, whilst they themselves follow the chase, some proceeding in Karbasses* to the best localities for fowling, and bringing home large quantities of ducks and geese; others on horseback following the rein-deer along the valleys and streams. Two hunters usually go together, each dragging after him a light wetka, and being followed by two or more trained dogs. They either find the rein-deer standing up to their necks in water, to avoid the mosquitoes, and to keep themselves cool, or the dogs drive them into the river. Meanwhile the hunters launch their light canoes, which they can paddle faster than the deer can swim, and having succeeded in hemming them in, they despatch them with a kind of light spear called Pokoliuga. If, as often happens, they cannot at once carry home their spoil, they bury it in the under-stratum of constantly-frozen earth, until they can come with sledges to take it away; in which case it sometimes happens that the wolves are before-hand with them, and the hunters find nothing left but the bones. Whilst we were in this district, we came quite unexpectedly on a large herd of rein-deer, which were lying quietly in the water, above which their huge antlers rose like the dry branches of a grove of trees. Two of our Iukahirs threw themselves instantly into the light boat and gave chase, but not being properly armed, they only succeeded in killing two females. We, who were in the large boat, shot a fine buck.

* The karbasses are large, heavy, flat-bottom boats, formed of hollow trunks of trees, carrying cargoes of fifty pood weight; the best are made from the largest and soundest trees of a poplar-like species of aspen, which grows round Verkni Kolymsk.

The rest of the herd gained the bank in safety, and soon disappeared from our view.

We were disappointed by finding that the horses we had ordered had not yet arrived at the lesser Tchukotskia. It was some comfort, however, to see that our own fishery at this place was proceeding most prosperously. The drying-scaffolds were completely covered with fish, chiefly herrings and the species called Tschir, and we all set ourselves to work to erect more scaffolds, which were soon filled likewise.

On the first of July a Iakut arrived, bringing five horses, and the very disagreeable intelligence that it was impossible to procure more. Of these five horses only two were strong enough to carry the tent, provisions, and instruments, and there remained only three weak horses for riding. But for the great and well-grounded confidence which I felt in M. Kosmin's experience, ability, and persevering energy, I could not have ventured on despatching only three persons with indifferent horses, on such a journey, across a desert region, intersected by numerous broad and rapid streams, and devoid of all resource. Having given him my final instructions, he set out on the 2nd of July, accompanied by the Iakut and a young Cossack. They took with them two light wetkas, for crossing the rivers.

The next day some men, whom I had sent down the river in the Karbass, to shoot geese and swans, returned with the information that Tchukotskaia Bay, and even the mouth of the river itself, were still covered with solid ice. I was therefore obliged, most reluctantly, to await a change in the wind, which was now blowing freshly from the north and north-west, and drove

the sea-ice into the river instead of clearing it. Day after day we examined the state of the ice, and still found it impossible for a boat to pass. After waiting impatiently for some days, I thought it best to give up the attempt for the present, and turn my back on this desert plain, where the eye is uncheered by the sight of a tree, a shrub, or even a blade of green grass. Though it was July, the wind from the north was keen and very cold; snow fell frequently, and remained whole days on the ground without melting. Whilst returning in the boat, I occupied myself in surveying, and in determining the position of some of the most remarkable points in the Kolyma. On the 15th of July I was at the mouth of the Krutaia, in the parallel of the Sucharnaia mountain, the latitude of which I wished to determine. My tent had been pitched amongst some willow-bushes, and a small fire had been lighted on the windward side, in order that the smoke from it might drive away the mosquitoes, which had re-appeared on the weather becoming a little milder. I had only two people with me, having left one sailor behind to hunt, and the rest had returned to their homes, to procure the necessary provisions for their families. It really seemed as if my present attempt, which had had such an ill-omened beginning, was not to succeed; for after all the vexatious delays already met with, an accident happened, which had nearly deprived me of the fruits of all our preceding labours. We had rowed, as usual, into the middle of the stream, to get pure water for cooking, that near the banks being muddy, and had not thought it necessary to extinguish the fire, on account of so short an absence, when a sudden gust of wind

drove it towards the tent, and before we could reach the shore, every thing was in flames. The loss was a very serious one, but it would have been far more so if I had not succeeded in rescuing a box containing all my papers, journals, charts, and instruments, before the flames had penetrated the thick covering of fur in which it was enveloped.

This accident, by destroying many articles indispensable for our voyage, decided my return to Nijnei Kolymsk. We arrived there on the 20th of July, and found MM. von Matiuschkin and Kyber preparing for their journey up the Aniui. As I had taken cold, and suffered much from rheumatism, Dr. Kyber advised me to go to Sredne Kolymsk, where the milder and less variable climate, and the use of lighter and fresher food, would probably contribute materially to restore my health. Accordingly I took the boat up the Kolyma on the 26th, and the two travellers to the Aniui left Nijnei Kolymsk the same day.

The further I receded from the low lands, which are subject to the blighting influence of the Polar Sea, the more pleasing became the aspect of the country, which loses the dreary uniformity of the Polar region, and is inhabited by a well-disposed and industrious population, the Iakuts of Sredne Kolymsk. I quitted my boat at the village of Nisowoi Albut which is the most northern Iakut settlement, and is distant 150 wersts from the town of Sredne Kolymsk, and continued my journey on horseback. After so many months passed in icy deserts, the fields covered with luxuriant grass, the vigorous larch-trees, poplars, and willows, the numerous herds,

and frequent settlements, appeared quite a paradise to me. The soil, the vegetation, the milder air, the whole aspect of the land, breathed life and cheerfulness.

The vegetation is especially luxuriant in the Albuty, or dried-up lakes, which are numerous in this district, and form one of the peculiar features of Northern Siberia. These flat valleys are occasionally filled with water by the overflowing of the rivers in spring, when they form lakes of various sizes, all very full of fish. The intense frosts of winter cause large clefts in the ground, by which the water drains off, sometimes in the course of a single year, sometimes in several. The rich alluvial soil thus exposed, soon becomes covered with a luxuriant growth of the finest grass, and the Iakuts never fail to settle near these fresh pastures, so that most of the settlements in this district are called Albuty.*

The aspect of these summer settlements, with the cattle feeding, and the herdsmen not muffled in furs, but dressed in light and convenient clothing, was most pleasing. I was particularly struck by the summer habitation (letowie) of a wealthy Iakut chief, who had come with his whole tribe, and with his herds of cattle and horses from the forests where they had spent the winter. His *Uross*† was surrounded by similar but smaller huts, in which his nearest kinsfolk and his servants were lodged; the whole was enclosed by

* A curious phenomenon occurs in the lakes in the vicinity of the village of Alaseia. In the middle of winter the water sometimes suddenly disappears without any side-channels being visible. In such cases a loud noise is heard at the time the water disappears, and when the bottom of the lake is laid bare, large clefts are visible, occasioned by the severity of the frost.

† Described in chapter ii., p. 24.

an extensive fence, within which the cattle were driven at night. Every thing announced a prosperous condition, associated with patriarchal simplicity, peace, and purity of manners. The hospitable and friendly reception which I met with, the mildness of the air in these valleys, which are sheltered by the surrounding hills and forests, the abundance of excellent milk, and other fresh food, and finally, the complete repose of mind which I enjoyed, whilst away from all anxious employment, and surrounded by the beauties of nature,—all combined to induce me to spend the short remains of summer here, in laying in a store of health and strength against the toils of the following winter. I soon felt the beneficial effects of this new mode of life; and I shall ever remember with gratitude and pleasure the time which I passed among these kind, and, as they appeared to me, happy people.

I made several excursions on foot to different Albuty, twenty or thirty wersts off. In one of them, called Sul'gi Etar (horse pasture), I met with a Iakut eighty-two years of age, named after Lieutenant Laptew, who visited the Kolyma in 1739. He had married a Russian woman, and could not only speak Russian fluently, but also read and wrote it with ease. In spite of his great age, he was so healthy and vigorous, that he used to ride long distances with the young men, drive the cattle to and from their pasture, and take his share in most of the country occupations. He was very fond of tea and of punch, which are very expensive luxuries in this place. I used to pass many agreeable hours with this unusually civilized Iakut. He complained of the ignorance of his countrymen, who he said, had been formerly more

civilized; and that before they separated from the other Tartar races, to whom they are allied, they had possessed written characters, and consequently means of intellectual cultivation, which they have since lost. He maintained, that his race had once inhabited far distant southern regions, and in proof of it he quoted several popular sayings, in which gold and gems, lions and tigers are mentioned, of which they are now entirely ignorant. He was unable to speak more definitely concerning their earlier condition and country, as such accounts have only been handed down by traditions, which have been in great measure lost since Shamanism has yielded to Christianity. He said, that litigiousness, dishonesty, and deceit, had increased, and complained particularly, that the immoderate use of spirituous liquors (of which he was rather fond himself) had caused such a physical deterioration in the race, that no one now attained to the age of a hundred years and upwards, as was often the case in his father's time. He talked much of the severe climate, the frequent failure of the hay harvest, and the ravages of wolves. I will here recount all that I could collect from his narrations, and from conversation with his countrymen, concerning their earlier history.

The Iakuts who live on the banks of the Kolyma are not the first inhabitants of the country; their predecessors were the Omoki, the Chelagi, the Tunguses, and the Iukahirs. The Omoki, who were settled fishermen, and the Chelagi, who were a nomade people having rein-deer, have so wholly disappeared, partly from wars with the intruders, and partly from devastating sickness, that their names are now hardly remembered.

The Iukahirs, who were once a numerous nomade race, have much diminished. Most of them have lost their rein-deer by sickness, and now live poorly as fishermen, along the banks of rivers. Some few have preserved their rein-deer, and have withdrawn with them into the tundras near the sea. The Iakuts alone have not only not diminished in number, but have made very considerable progress both in population and in cultivating the ground. They have the great merit of having introduced the care of cattle and horses, and other branches of rural industry, into a land where the soil, and still more the climate, appeared to forbid the attempt, and by their persevering exertions have attained not merely a scanty subsistence, but some degree of comfort. They may be said to have rendered these inhospitable steppes accessible to the bold descendants of Iermak, who have introduced Christianity, and rescued an ignorant and superstitious people from Shamanism and its barbarous customs.* The Iakuts are now all baptized. A priest from Sredne Kolymsk visits these settlements every year. An ecclesiastic named Slezzow, who lived here twenty years ago, showed undaunted and unwearied zeal in the abolition of Shamanism. Wherever he discovered idols or heathen altars, they were destroyed by fire or by water, and none such are now to be met with. There are still, however, as I have noticed in an earlier chapter, Shamans, who have a few adherents, and are generally con-

* It was a frequent practice to expose new-born female children in baskets, which were suspended to trees. It sometimes happened, that before the infants perished from cold and hunger, they were found and adopted by strangers. Old women are still to be met with in families of which they became members in this way.

sulted, even by Russians, in regard to finding a stray beast, or discovering a theft. All that has been said of the Iakuts of the Iakutsk district, applies to those of the Kolyma. Their language, their habitations, their clothing, and their modes of life, are the same; but the hunting weapons of those of the Kolyma, consist only of bows and arrows, and a large and strong knife called Pal'ma.

As their horses subsist during winter on the grass which they find under the snow, the Iakuts migrate in spring with their herds, in order to leave the pasture in the neighbourhood of their winter-dwellings undisturbed. The number of horned cattle which they can keep, depends on the supply of winter forage which they can obtain, and nothing can exceed the activity with which they pursue this most important object during the short summer. Throughout the whole of the hay-making season, they live almost entirely on kumyss, of which they sometimes drink whole pails-full at a time. It agrees with them remarkably well, and they grow fat and strong with hardly any other food. One of the greatest disasters which can befall them is a sudden and early winter, cutting short the hay-harvest. Such an occurrence took place in this year. A keen wind from the north-west set in on the 22nd of August, with a heavy fall of snow, which soon covered all the hay remaining in the meadows. As only part had been stacked, the loss was very great. It was followed by such severe cold that the lakes froze, and troops of wolves came out of the forest and carried off above eighty cows. At the same time the Kolyma was so unusually swollen, that the fishery failed in a great measure.

A winter of scarcity seemed inevitable: but nothing appeared to distress the herdsmen so much as being obliged, on account of the insufficient store of hay, to diminish still further the number of their cattle, many of which they had already lost by the ravages of the wolves.

It was now time for me to return to Nijnei Kolymsk. I parted from these kind people, among whom I had recovered my health, and who were cheerful and happy when I first saw them, without being able to offer them anything in their distress except the expression of sincere sympathy. I left them on the 31st of August, and passed the night 40 wersts off, at a Russian village on the banks of the Timkina. Next day, 1st September, I found that my boat was already frozen in, and we had some difficulty in working it for two wersts through the ice which covered the small river: this brought us to the Kolyma, which owing to its greater breadth and stronger current was still free from ice. We descended its stream rapidly, and arrived the same day at Nijnei Kolymsk.

I found there Serjeant Reschetnikow, who had returned from the Baranika, having completed the buildings. He and his people had been frequently disturbed at their work by dangerous visits from white bears. I learnt from him that large numbers of swans and geese resorted to that neighbourhood for breeding and moulting, and that that part of the sea was rich in a species of fish resembling Loaches (Schmerlen) called Golzy. The sailor whom I had left at the mouth of the lesser Tchukotskia, returned soon afterwards, and told me that both that river and the eastern mouth of the Kolyma had been completely frozen

over, as early as the 21st of August. Violent storms and frequent falls of snow had prevented him from shooting more than sixty head of swans and geese. The fishery had been very successful.

Winter was now rapidly approaching: on the 6th of September there was much floating ice, and on the 8th, the Kolyma was frozen over. The inhabitants had not yet returned from their summer occupations, and their deserted houses were completely covered by the snow, which had fallen almost without intermission. The only person who usually remains at home during the summer, is an old Cossack, who has the charge of the town chancellery. His solitude had been shared on the present occasion by an old woman, who was too infirm to accompany her friends; and on my arrival the whole population consisted of these two persons, myself, and three men belonging to our expedition. The inhabitants gradually returned, and with much labour opened paths to their houses, and cleared out the snow which had in many cases filled the rooms, as the plates of ice used for windows had melted during the summer, and the slight shutters had not been in all cases strong enough to keep out the storms of wind and drifting snow. The tidings brought by the new comers were by no means cheering; some complained of failure in hunting, others in fishing, and looked forward to a winter of distress and scarcity. Amidst this general anxiety I was gladdened by the arrival of the post from Iakutsk: long-looked-for letters carried me back in thought to my far-distant friends and kindred, and afforded me inexpressible delight, checked by the recollection that they had been six months in reaching me from Petersburgh.

On the 29th of September, MM. von Matiuschkin and Kyber returned from their journey up the greater and the lesser Aniui, and a week later we rejoiced at the safe return of M. Kosmin from his coast expedition to the Indigirka. We were now all assembled again, and after spending the days in arranging our papers and journals, and entering our observations on the chart, we used to gather round the social hearth, and pass away the long evenings in recounting our several adventures.

CHAPTER IX.

M. VON MATIUSCHKIN'S ACCOUNT OF A JOURNEY ALONG THE LESSER AND THE GREATER ANIUI RIVERS.

§ I.—THE LESSER ANIUI.

Departure from Nijnei Kolymsk.—Mammoth Bones.—Arrival at Plotbischtsche.—Aboriginal Population of this District.—Present Inhabitants.—Causes of the Scantiness of the Population.—Iukahirs.—Migration of the Rein-deer in Spring and Summer.—Departure from Plotbischtsche.—Argunowo.—Poginden.—Termination of the Journey.—The Rock Obrom.—Return to Plotbischtsche.—General Remarks on the Lesser Aniui.

On the 20th of June, 1821, Dr. Kyber and I embarked in a small boat, and with a fresh N. N. W. wind entered the great Aniui, which empties itself by three arms into the Kolyma, opposite to the Ostrog of Nijnei Kolymsk. We were followed by the karbass in which our voyage was to be made; our few packages were soon transferred, and we rowed quickly up the stream, which is here about a werst broad, and has scarcely any current. We reached in the night the mouths

of two smaller wiski (streams having their origin in lakes) which are much resorted to for fishing by means of weirs and baskets, and are very productive, both in spring when the fish are going up to the lakes, and in summer when they are returning to the sea; and many summer-dwellings have been erected in consequence. We were detained here, engaging rowers, and making arrangements, till the 23rd, when we resumed our voyage.

About ten wersts higher up we passed the mouth of the river Baiukowa, which rises in some distant mountains just visible to the south. Soon after we came to the branch which unites the greater and the lesser or dry Aniui, and entered the latter, and having followed its windings for 20 wersts, we halted for the night at a low sandy island, where we were secure from the visits of any of the numerous bears which we saw on both sides of the river. The two next days, 24th and 25th, we were favoured by the wind, and advanced rapidly. The boat being quite an open one, we were completely wet through by the heavy rain which had fallen incessantly during the last three days, and were delighted to meet, at a place called Kildan, with a balagan, which had been erected for their own use by the merchants who travel to Ostrownoie. We remained there the next day to make several little alterations and improvements in our boat, one of which was to put up a mast to which a tow-line could be fastened, as we knew that the rapid current higher up would probably make such a mode of proceeding necessary. I employed myself meantime in arrangements respecting my journal, map, &c. I considered that to lay down precisely all the different wind-

ings and distances would be a useless occupation of time and labour; I therefore contented myself on this journey with taking observations of latitude, and angles of azimuth for determining the principal points.

The banks of the river thus far resembled those of the Lower Kolyma by their dreary uniformity, but we now began to meet with better pastures. The right bank is much higher than the left. It consists of steep sand-hills 30 or more fathoms high, and held together only by the perpetual ice which the summer is too short to dissolve. Most of the hills were frozen as hard as a rock; nothing thaws but a thin outside layer, which being gradually undermined by the water, often causes large masses of frozen sand to break off and fall into the stream. When this happens, mammoth-bones in more or less good preservation are usually found: we saw a few bones, and a skull, which looked to me like that of a rhinoceros.*

As we ascended the stream, the current became much more rapid; the river makes a number of short bends, and forms many small islands. Its bed is strewed with rough and sharp-pointed stones, against one of which we were driven by

* Without entering in this place into any speculations concerning the manner in which these probably antediluvian remains came into their present situations, I would call attention to the remarkable fact that the teeth, tusks and bones, which are called by the general name of mammoth bones, but which probably belong to several different species of animals, are not distributed equably over Siberia, but form immense local accumulations, which become both richer and more extensive the further one advances to the north. They are found in the greatest abundance in New Siberia and the Liakhow Islands, as mentioned by Reschetnikow and Sannikow. Many hundred pood weight are collected there every year, whereas, on the continent, they are much scarcer, and are hardly ever met with in the southern part of Siberia.

the current, and sprung a leak: but the boat was drawn on shore, emptied, and the damage repaired in the course of two hours. The banks became higher as we receded from Kildan, the fine reddish sand was replaced by gravel and stone, and at Molotkowo we saw slate rocks intersected by veins of quartz.

The strength of the current prevented us from reaching Plotbischtsche until the third day. It is here that the rein-deer usually cross the river in their autumn migration, and we found crowds of hunters impatiently awaiting their passage. It was an anxious time, for many of the settlements were already threatened with a deficiency of food. We were hospitably received by a Iukahir chief named Korkin, who gave us the best he had, namely dried rein-deer venison and train oil, but entirely refused payment. Under the circumstances of scarcity and doubt, this liberality, which extended to many of the hunters as well as to ourselves, might appear to savour of improvidence; but such is true hospitality, which prevails throughout the Russian Empire, from Petersburgh to Kamtschatka, from the Caucasus to the Polar Sea; and among the nomades of Siberia especially, the best is always for the guest.

Dr. Kyber wished to remain here a little while, partly for medical pursuits, and partly for those of natural history. I tried meanwhile to learn as much as I could respecting the past and present condition of the inhabitants. Before the conquest of Siberia by the Russians, the population was every where greater than at present. Some numerous races (as has been before noticed) have left only their names behind; and yet there are still, on a comparatively small surface, eight

or ten distinct races, some consisting of only a few families, but all distinguishable from each other by language, customs, and features: they appear to be *fragments* of more numerous tribes; some have perhaps come from a distance; the more independent nomade races retreated before their invaders further and further to the east. Our host maintained that he himself was descended from the Omoki,* and that their language was still preserved in his family.

This nation appears to have possessed a certain degree of civilization, and amongst other things, to have been acquainted with the use of iron before the arrival of the Russians. As the Russian conquests advanced, and as the small-pox and other contagious diseases, which accompanied or preceded their course, committed fearful ravages, the Omoki determined to remove, and left the banks of the Kolyma in two large divisions, with their rein-deer. My host said that they went northwards, but he could not tell where; probably they turned to the west along the coast of the Polar Sea, for there are now traces near the mouth of the Indigirka of numerous yourtes, though the oldest people do not know of there ever having been any settlement in that part of the country. The place is still called Omokskoie Yurtowichtche.†

The deserted banks of the Kolyma were gradually occupied by different tribes, of which the most important were the Iukahirs, the Tunguses from the Steppes on the Amur, and the Tchu-

* See chapter iii., page 53.

† Where are the remnants of this once numerous nation now to be found? Can it be in Europe and on the banks of the Petschora, as some vague traditions would seem to suggest?

wanzes, who were pressed hither from the banks of the Anadyr by the Tchuktches. Such was the state of things in 1750, when Pawluzkii, Vaivod of Iakutsk, supported by the then numerous Tchuwanzes and Iukahirs, undertook a campaign against the Tchuktches. In this warfare most of the Tchuwanzes perished, as well as a great number of Iukahirs, and the remainder as well as the Russians were dreadfully ravaged by malignant fevers, small-pox in its most deadly form, and other contagious disorders, some of which are not even yet extirpated. There are now on the lesser Aniui only a few families of Iukahirs, who having lost their rein-deer have been obliged to relinquish their nomade life. They have been baptized, and have gradually laid aside their national peculiarities, and all speak Russian. Their habitations and clothing resemble, and were probably the originals of, those already described as in use at Nijnei Kolymsk. They have generally black eyes, dark hair, a longish and remarkably pale face, and tolerably regular features.

They still possess the cheerful disposition, unbounded hospitality, and other similar good qualities, which usually characterize a nomade people, and are often lost by civilization; but, in their intercourse with the Russians, whom they still regard as oppressors, they show a sort of distrustful dissimulation, and will go great lengths to overreach them in trade. They are passionately fond of music, and almost all play some airs on the violin or the Balalaika. The women have rather agreeable voices. Their singing is quite peculiar, irregular and wild, but after the ear becomes accustomed to it, it is not unpleasing. They generally improvise both the words and the

air, but the words have nothing original; they appear to be entirely imitated from the Russians.

The fisheries along the banks of the Aniui are generally unimportant, as the larger kinds of fish are not met with above Plotbischtsche, the inhabitants have to subsist therefore almost entirely on the produce of the chase. Like the Laplanders, their food, clothing, and all their principal wants, are supplied by the rein-deer.

The two most important epochs of the year, are the spring and autumn migrations of the rein-deer. About the end of May these animals leave the forests, where they had found some degree of shelter from the winter cold, in large herds, and seek the northern plains nearer the sea, partly for the sake of the better pasture afforded by the moss tundras, and partly to fly from the mosquitoes and other insects, which literally speaking, torment them to death.

The hunting at this season is not nearly so important and valuable as in the autumn; as it often happens that the rivers are still frozen over, they afford no opportunity of intercepting the deer, and the hunters can only lie in wait for them among the ravines, to shoot them with guns or arrows. Success with the latter weapon is rather uncertain, and the high price of powder and ball is an objection to the use of guns; the more so as at this season the rein-deer are very thin, and so injured by insects that nothing but the extremity of hunger can render the flesh palatable: the animals killed in spring are commonly only used for the dogs. The true harvest, which we arrived just in time to see, is in August or September, when the rein-deer are returning from the plains to the forests. They are then healthy

and well fed, the venison is excellent, and as they have just acquired their winter coats the fur is thick and warm. The difference in the quality of the skins at the two seasons is such, that whilst an autumn skin is valued at five or six roubles, a spring one will only fetch one, or one and a-half rouble.

In good years the migrating body of rein-deer consists of many thousands; and though they are divided into herds of two or three hundred each, yet the herds keep so near together as to form only one immense mass, which is sometimes from 50 to 100 wersts in breadth. They always follow the same route, and in crossing the river near Plotbischtsche, they choose a place where a dry valley leads down to the stream on one side, and a flat sandy shore facilitates their landing on the other. As each separate herd approaches the river, the deer draw more closely together, and the largest and strongest takes the lead. He advances, closely followed by a few of the others, with head erect, and apparently intent on examining the locality. When he has satisfied himself, he enters the river, the rest of the herd crowd after him, and in a few minutes the surface is covered with them.

Then the hunters, who had been concealed to leeward, rush in their light canoes from their hiding-places, surround the deer, and delay their passage, whilst two or three chosen men armed with short spears, dash into the middle of the herd and despatch large numbers in an incredibly short time; or at least wound them so, that if they reach the bank, it is only to fall into the hands of the women and children.

The office of the spearmen is a very dangerous

one. It is no easy thing to keep the light boat afloat among the dense crowd of the swimming deer, which, moreover, make considerable resistance; the males with their horns, teeth, and hind legs, whilst the females try to overset the boat by getting their fore-feet over the gunnel; if they succeed in this, the hunter is lost, for it is hardly possible that he should extricate himself from the throng; but the skill of these people is so great, that accidents very rarely occur. A good hunter may kill 100 or more in less than half an hour. When the herd is large, and gets into disorder, it often happens that their antlers become entangled with each other; they are then unable to defend themselves, and the business is much easier. Meanwhile the rest of the boats pick up the slain, and fasten them together with thongs, and every one is allowed to keep what he lays hold of in this manner. It might seem that in this way nothing would be left to requite the spearmen for their skill, and the danger they have encountered; but whilst every thing taken in the river is the property of whoever secures it, the wounded animals which reach the bank before they fall, belong to the spearman who wounded them. The skill and experience of these men is such, that in the thickest of the conflict, when every energy is taxed to the uttermost, and their lives are every moment at stake, they have sufficient presence of mind to contrive to measure the force of their blows so as to kill the smallest animals outright, but only to wound the larger and finer ones, so that they may be just able to reach the bank. Such proceeding is not sanctioned by the general voice, but it seems nevertheless to be almost always practised.

The whole scene is of a most singular and

curious character, and quite indescribable. The throng of thousands of swimming rein-deer, the sound produced by the striking together of their antlers, the swift canoes dashing in amongst them, the terror of the frightened animals, the danger of the huntsmen, the shouts of warning, advice or applause from their friends, the blood-stained water, and all the accompanying circumstances, form a whole which no one can picture to himself without having witnessed the scene.

When the chase is over, and the spoils are distributed, the deer which have been killed are sunk in the river, the ice-cold water of which preserves them for several days, till there is time to prepare them for winter use. For this purpose the flesh is either dried in the air, smoked, or, if early frosts set in, frozen. The Russians sometimes salt the best pieces. The tongues are considered the greatest delicacy, and are reserved for special occasions.

We passed two weeks at Plotbischtsche, and left it on the 13th of August, when the rein-deer hunt was quite over. We arrived at night at Argunowo, where we found a few families still awaiting the passage of some of the deer.

About twenty wersts above Argunowo, the Aniui is joined from the north by the Poginden, a stream of nearly equal breadth. The rein-deer pass the river as high up as this place, but not much beyond, as its course is then broken by waterfalls. There are no settlements on the Poginden, but in winter, when it is frozen, it affords a smooth and convenient road to the Iukahirs, who are going to the mountains and to the banks of the Beresowaia and Baranika, where wild sheep abound.

At Argunowo the river-views became more

pleasing: the dark rocks were replaced by gently swelling and varied slopes, and the windings of the stream were chequered by small islands, with groups of poplar-trees. A few small herds of rein-deer, which had apparently lingered behind the main body, added animation to the scene. The rapid current allowed us to advance only very slowly.

We passed the night of the 16th in a deep ravine, between two rocky hills, one of which is named from an extensive enclosure, into which the migrating rein-deer are enticed by various devices. As the evening was clear, I ascended one of the hills, which I thought would command an extensive prospect, with the intention of obtaining some angles, but I found that my view was shut in by dark rocks in almost every direction, and I had to return without effecting my purpose. Next day we came in sight of the rock Obrom, which was to form the termination of our journey; its summit was veiled in clouds. We passed the fort of Ostrownoie, and arrived, on the evening of the 17th, at the summer village of Obromsk, where we found only women and children, the men not having yet returned from the rein-deer hunt.

Dr. Kyber wished to stay here a few days, during which I wandered about the country with my dogs and gun.

An Iukahir accompanied me as a guide up the Obrom rock: the path which we took was rugged and dangerous, but the view from the snow-clad summit amply repaid me. To the north were undulating snowy mountains, which lost themselves in the blue ice and mist of the frozen sea; the dark red beams of the setting sun, heralds of

an approaching storm, gilded the summits of the mountains, and reflected by the particles of ice which filled the air, formed innumerable rainbows; here and there dark rocks rose from the mist, like islands in the ocean. There are features peculiar to the icy regions of the Polar Circle, which cannot be conveyed by description, but which challenge no less admiration than the smiling beauty of more favoured regions. Whilst I was contemplating the picture before me, the death-like stillness which prevailed was suddenly broken by violent gusts of wind, howling and sweeping through the ravines, and whirling up high columns of snow and sand; my guide urged our speedy return by an easier path than we had followed in the morning, and on which the side of the mountain would afford us some protection from the storm.

The Obrom is wooded half-way up; fine larch trees grow near the foot; these are succeeded by shrubs of the same species; higher up, the ground is covered by the creeping cedar, to which succeed coarse grass and moss. The rock itself consists of granite, very much weathered, with occasional patches of vegetable earth.

Bad weather, storms, rain, and snow, had now set in; the few deciduous trees lost their leaves; the north sides of the hills were covered with snow, and broad margins of ice began to form along the river.

On the 21st of August we commenced our return, and aided by a favourable wind, descended the stream at five knots an hour, and reached Plotbischtsche the evening of the second day. We heard from both sides of the river the cheerful songs of the successful hunters, and saw the

banks everywhere lined with the numerous reindeer which had been killed; they were placed under water, and covered with branches: we shouted our hearty congratulations, and passed on without stopping.

From Plotbischtsche to Obrom the navigation is rendered difficult and hazardous by numerous islands, rocks, and sand-banks; higher up, the river is quite unnavigable. The Aniui, being a mountain stream, is subject to overflow violently and suddenly. It every year carries away islands, and forms new ones, and sometimes alters its course for several wersts. The shallows and rapids shift their places so frequently, that even the people who live on its banks do not profess to know them.

§ II.—THE GREATER ANIUI.

Journey continued on Horseback.—The Mountain-Chain of the Greater Aniui.—The Kameschkowa.—Fur-Hunting.—Traps.—Tigischka.—Arrival at Sladnoie and Lebasnoie.—The Emperor's Name-day.—Failure of the Rein-deer Hunt.—Famine.—Return by Water.—Inhabitants of the Banks of the Greater Aniui.—Tunguses, Lamuts, Tchuwanzes, and Iakuts.—Their Modes of Life, and Numbers.—Shamanism and Shamans.—Dolgoie.—Arrival at Bol'schaja Brussanka.—Freezing of the River.—Continuation of the Journey in Sledges drawn by Dogs.—Baskowo.—Arrival at Nijnei Kolymsk.—Remarks on the different Tribes whom we visited during this Journey.

Our journey from Plotbischtsche was to be continued on horseback, but as the six horses which we required were not ready, we could not take our departure before the 25th of August. The continuance of violent wind and heavy snow-storms, added to the great morasses (badarany) which we had to pass, rendered the land-travelling far from agreeable. Thirty wersts along a narrow foot-path brought us to the naked summit of the elevated ridge, which divides the two rivers Aniui from each other. We were greeted by an inhabitant of the mountain in the shape of a huge

black bear, which sprang suddenly upon us from the wood; our horses were terrified, but the bear was no less so, and disappeared in the thicket before we had time to level our guns. Such encounters are very frequent in this part of the country, but the bears are not always so harmless. Two of these beasts attacked a Lamutian hut at night, when the family were asleep, and destroyed them all except one man, who succeeded in making his escape.

We pitched our tent for the night about three wersts from the foot of the mountain, on the banks of the Kameschkowa, which falls into the greater Aniui, near Patistennoi. It was not very late, and as many tracks of sables were visible on the new-fallen snow, I walked a little way with my gun, in hopes of killing some. My inexperience in this kind of chase, was probably the reason why I did not even get sight of a single sable; however, I shot several ptarmigan, which afforded a very welcome addition to our supper.

On the banks of both the greater and the lesser Aniui, there are an immense number of traps and snares of all kinds, for catching the sables, ermines, grey squirrels, wolverines, and foxes, which still abound, notwithstanding all the arts resorted to for their destruction. From two to three hundred sables, are often taken in the course of the autumn. An industrious Iukahir usually sets about five hundred different traps, when the first snow falls. He visits them five or six times in the course of the winter, and in a good year, he commonly finds one take in every eighth or tenth trap.

There are a great variety of these traps; all are made of wood, without any iron, and with no

other tool than a hatchet, and show remarkable ingenuity and mechanical skill. They are so perfectly adapted to the peculiar habits, mode of running, and degree of strength of the different animals they are designed to catch, that it would seem impossible to make any further improvements in them. That great practical teacher, necessity, has induced the Iukahirs to exercise to the utmost their inventive faculties, on the only branch of industry by which they can earn money, and they have attained a high degree of perfection in the art, both as respects the mode of ensnaring the fur-animals, and in the necessary training of the dogs and rein-deer employed in the chase.

On the night of the 26th of August, we reached the little settlement of Tigischka, on the banks of the greater Aniui; we found no one there except two half-starved women. As Dr. Kyber was ill, and unable to continue the journey on horseback, we were obliged to halt, and to send one of our people to Sladkoie, where a great number of persons were assembled for the rein-deer hunt, and where, therefore, we hoped to be able to obtain a good-sized boat. The next day the boat arrived, but it was so narrow, that it was impossible to stow ourselves and our luggage in it. We therefore agreed that Dr. Kyber should embark by himself, and that I should ride along the river-side as far as Lobasnoie, where we hoped to find a larger karbass, in which we might both proceed, according to our original plan, as far as the mouth of the Angarka, where there was formerly a small fort, and where the Tchuktches were in the habit of resorting every year for barter.

On the 28th of August, I continued my journey; the ground was covered with snow, and we

had to make our way through thickets and across streams and morasses. High wind and falling snow continued throughout the day, and we were glad to take shelter for the night under the steep bank of the river Vetrenowka. The woods through which we had been travelling were much finer than those of the lesser Aniui. We saw, besides larch, a quantity of well-grown birches, poplars, willows, aspens, and other species of trees. We passed several old burying-places of the earlier inhabitants, which were little wooden buildings, resembling the Saibes or places for depositing provisions. The corpses were clothed and armed with bows, arrows, and spears, and the Shamans had their magic drum put in their hand. We saw at some little distance from our path, an old wooden building, resembling a kind of fortification, and made of boards which appeared to have been formed by the aid of stone hatchets. The bad weather, the deep snow, and the lateness of the hour, did not admit of a closer examination.

The Vetrenowka has many windings, and its banks are steep and rocky. The hollows between the hills and rocks are covered almost everywhere with angular fragments of stone, which have not yet been rounded by the action of water. Both here, and on the lesser or dry Aniui, I frequently met with slate with veins of spar, and occasionally with cornelian and quartz, the former in very small pieces, and the latter in rather large masses. I found here a mammoth's jaw-bone in tolerably good preservation.

After a rather uncomfortable night, we continued our journey next morning. It had struck me several times the day before, that the guide was not altogether well acquainted with the way:

and on seeing him to-day turn sometimes in one direction and sometimes in another, without any apparent reason, I expressed to him my doubts as to his knowledge of the district. However, he maintained stoutly that he had often been here before, and to prove it, he ran over the names of the various hills and streams which we had passed. Meanwhile night came on, and we were still wandering through rugged and desert ravines, our horses almost knocked up, when at last the guide acknowledged that he did not know in what direction to look for the Aniui. I had now to seek a way out of the wilderness as well as I could. My own opinion was, that the river lay to the westward, and not having any compass, I directed my course to that quarter by the bark of the larch-trees, which throughout northern Siberia is black on the north, and red on the south side of the tree. The fur-hunters often direct their course through the trackless forests by this sign.

We came shortly to a stream which we supposed flowed into the Aniui, and as the darkness rendered the mountain-paths both difficult and dangerous, I determined on following the course of the stream, which became gradually larger, and assumed a north-west direction. After proceeding twenty wersts further, we heard to our great joy the rushing sound of the swollen river dashing over the rocks and stones which intercepted its course. We soon reached its banks, and found that, after having gone a long way out of our road, we had come out opposite to the village of Sladkoie. We sheltered ourselves from the wind and snow in a half-ruined balagan, which stood near the river.

Our fire attracted the notice of the Iukahirs on

the opposite bank, and some of them came across to us, gave us fresh rein-deer meat, and told us that Dr. Kyber had arrived in the course of the day. As our horses were quite knocked up, and unfit to continue the journey, I determined to leave most of our things here under the care of our Iukahir, and to cross over to Sladkoie in a little boat. Next day Dr. Kyber and I proceeded in a karbass, and after a passage which lasted seven hours, and which was rendered dangerous by the high wind and the force of the waves, we arrived on the 30th of August at Lobasnoie, where a large number of rein-deer are usually taken at this season. We heard several shots fired, and as we approached nearer we were greeted by the sound of songs. We were met on landing by two Iukahir chiefs, who told us that they were celebrating the name-day of the Emperor, or as he is called here, the White or free Czar, the Son of the Sun. We joined them, and distributed tobacco and brandy, which added to the general hilarity. The men displayed their skill in shooting at a mark with bows and arrows, and with guns; they had also foot-races, and boat-races, and the women sang and danced. The rejoicings continued till day-break: doubtless the day was celebrated in a far more brilliant manner in many parts of the Russian Empire, but it can hardly have been kept any where with more cordiality and cheerfulness than at this obscure village, 12,000 wersts from the imperial residence.

We found that a great number of sick people had collected here to await our arrival, and Dr. Kyber decided on staying a fortnight on their account. As there were several surgical operations to be performed, he had his hands quite full; but

the uninterrupted bad weather, with thick-falling snow, detained me almost the whole time in irksome inactivity. It was hardly possible to make any excursion in the neighbourhood, and I had to consider myself fortunate in getting one meridian altitude for latitude.

The inhabitants say that they find various crystals, chalcedony, and cornelian in the mountains, and at the mouth of the river flints of an unusual size, marked with impressions of plants and shells. In a high cliff of black slate near the little river of Sladkoie which we followed to the Aniui, there is a whitish earth, which has a sweetish, and rather astringent taste, and to which the Iukahirs ascribe a variety of sanatory properties.

The district of the greater Aniui must be more interesting than that of the lesser Aniui, both on account of its denser population, and of the greater variety both of plants and animals. We were therefore doubly mortified at the state of the weather, which almost precluded us from making our own observations, and obliged us to be contented with such imperfect and uncertain notices as we could glean from the inhabitants.

The migratory rein-deer had not yet passed the river at this place. Their arrival was expected with the utmost anxiety, for scarcity was already severely felt. It is not easy to imagine the fearful excess which famine reaches among a people whose whole support depends on one precarious incident. It often happens that many among them have to subsist during the latter part of summer almost entirely on the skins which form their bedding and clothing; and if happily a single rein-deer is killed it is immediately cut up, divided among the whole tribe, and literally eaten skin and all, the hair being just singed off. The

contents of the stomach, and even the horns are used as food. Fish are not caught till later in the year, and even then only in small numbers, and few of the inhabitants venture to go off to the tundras in quest of game, for fear of missing the passage of the rein-deer, on which their support so essentially depends.

On the 12th of September the hungry people were filled with joy; by immense numbers of rein-deer approaching the right bank of the river opposite to Lobasnoie. I never saw such a multitude of these animals. At a distance their antlers resembled a moving forest. Crowds of people flocked in on every side, and hope beamed on every countenance as they arranged themselves in their light boats to await the passage of the deer. But whether the animals had seen and were terrified at the crowds of people, or whatever the reason may have been, after a short pause, they turned, left the bank, and disappeared among the mountains. The utter despair of the poor starving people was dreadful to witness. It manifested itself among these rude children of nature under various forms. Some wept aloud and wrung their hands; some threw themselves on the ground, and tore up the snow; others, and amongst them the more aged, stood silent and motionless, gazing with fixed and tearless eyes in the direction where their hopes had vanished. Feeling our utter inability to offer any alleviation to their misery, we hastened to quit this scene of woe, and resumed our voyage on the 30th, notwithstanding a violent contrary wind. Being favoured by the current, we reached Sladkoie the same night, and Dolgoie the following day.

Throughout the entire interval of about eighty

wersts, the river flows along the foot of an uninterrupted mountain ridge, from which bluff rocks occasionally project, and overhang the bed of the stream. These rocks consist partly of light grey granite, and partly of black slate, between which there are thin layers of ochre. The inhabitants were now having recourse to the fisheries as their only remaining though inadequate resource. Still the greater fisheries on this river, though not very productive, are usually far more so than those of the lesser Aniui, as the former stream is less wide but much deeper, and less rapid than the latter: and consequently the fish go higher up, and in larger quantities. But in the present year of distress even this last hope failed; only a few fish, and those small ones, were taken; more frequently the nets and baskets came up empty. The fowling season was over, general famine appeared inevitable, and no doubt many hundreds of the scanty population perished, as had been repeatedly the case in former years. The improvident and careless habits of the people, the great distances between their settlements, and the generally desert state of the country, combine to make it impossible for the government or its officers to effect any amelioration in their unfortunate condition. Most of these tribes were formerly nomades, who ranged with their tame rein-deer far and wide through the tundras in search of the best pasture. After the conquest of Siberia they were subject to tribute, and were restricted to a limited circle, within which they were often unable to find sufficient food for their rein-deer.* The consequence of this restriction

* A few Iukahirs and Tchuwanzes, under the conduct of a chief named Tchaia, have been successful in retaining their

has been the gradual loss of those animals, partly for want of pasture and partly from sickness, which, when it broke out in a single herd, spread rapidly amongst the rest, as they could no longer be withdrawn at once to escape the contagion. The people gradually adopted many of the customs of their conquerors, the Russians, in the form of their habitations and clothing, and in the employment of dogs* instead of rein-deer for draft; but they have retained that carelessness as to the future, which characterizes all nomade races. As Russian subjects they became at enmity with the Koraks and Tchuktches, who are their nearest neighbours, and many destructive conflicts have taken place between them.

Attachment to the land of their birth, and ignorance of the countries beyond the Kolyma, have combined to prevent them from spreading towards the west, and to retain them in a district, where their very existence depends on success in intercepting the wild rein-deer in their annual migration. Thus hunger, wars, and contagious diseases, which assume here a highly-malignant form, have combined to reduce the population. An old chief told me that some time ago the Tchuwanzes requested permission to remove to the uninhabited and fruitful districts along the Anadyr and the Penshen, but that the Commis-

nomade mode of life. They are distinguished from their countrymen by a more powerful frame of body, by the tents which form their habitations, and by their clothing, which resembles that worn by the Tchuktches, as does that of all the rein-deer-nomades of Siberia.

* The custom of using dogs as draft animals came no doubt originally from the Kamtschatdales, from whom the Russians adopted it. All the nations of north-eastern Siberia, were previously in the habit of employing rein-deer exclusively: the rein-deer is useful to his master in many more ways than the dog, but, on the other hand, he is more difficult to maintain.

sioners of the Kolymsk district had hitherto successfully opposed the granting of this petition, lest they should lose a large part of the advantages which they derived from the fur-trade with that people.

The Tchuwanzes and Iukahirs of the greater Aniui, from having had much less intercourse with the Russians than has been the case with the dwellers on the banks of the lesser Aniui, have retained much more of their original language, manners, and customs. The Lamuts and Tunguses along the two Aniui have also lost their tame rein-deer, and now live poorly on the uncertain produce of the chase and the fisheries, which are not very productive. Nor are those Iakuts much better off, who have been brought by the government from the banks of the Aldan, to aid in transporting provisions and other stores to the fort which formerly existed on the Anadyr: separated from the rest of their countrymen, they have forgotten even their own language, and have assimilated to the Russians in manners, modes of life, and even physical appearance. They live almost exclusively by fishing, and their only domestic animals are their dogs, which they use for draft.

The population on the banks of the Aniui has increased latterly, but this cannot be regarded as any sign of an improvement in the condition of the people. It is caused by the influx of the nomade tribes, who having lost their rein-deer by sickness or other accidents, are forced to seek their subsistence, like the rest of their countrymen, in the neighbourhood of the rivers. The number of persons in this district who still continue to lead a nomade life does not exceed 400. They have to pay a yearly tribute, which they bring partly in furs and partly in money.

They have all been baptized, and conform to the usages of the Russian Church at least once a-year, when the various settlements are visited by the priest of Kolymsk, for the purpose of solemnizing marriages, christenings, and burials, and of administering the Lord's Supper. The journey is a very difficult and laborious one, as it includes a round of many hundred wersts, at the worst season of the year, and in a wild and half-desert country. It is, however, a very profitable journey to the priest in pecuniary respects, from the number of presents which he receives. It is not uncommon for him to return with two or three sledges laden with the most costly furs, sables, ermines, foxes, &c.

Pagan superstitions have been a good deal checked by the introduction of Christianity; nevertheless, the belief in the power of good and evil spirits, and of the Shamans, have retained a good deal of influence, which singularly enough has extended to the Russians. I have even been assured that a priest, who was about to undertake a distant journey to Iakutsk, applied to a Shaman to afford him protection by his art against the accidents which might occur during the journey! Generally speaking, however, Shamanism has lost its religious character. With the Russians it is for the most part a mere mode of passing away the time, and they send for a Shaman to occupy an evening in the exercise of his art, just as in Europe people send for a conjuror.

After this digression I return to our journey. The cold increased daily; the ice along the margin of the river became broader, and we sometimes came to places, where the current was less rapid, which were frozen over so that we had

to open a passage by the aid of hatchets and poles. We hastened our course as much as possible, that before the river was actually frozen, we might arrive at some place where we could procure sledges. With great difficulty we reached Bolschaia Brussanka, where we were received at the summer dwelling of the Iakut Knasez or chief. We had to wait here until the stream should be completely frozen and the winter road open.

During our stay the cold seldom exceeded + 9°. The temperature of the water also altered but very slowly.

In the Aniui, as well as in all the more rapid and rocky streams of this district, the formation of ice takes place in two different manners: a thin crust spreads itself along the banks and over the smaller bays where the current is least rapid, but the greater part is formed in the bed of the river, in the hollows amongst the stones, where the weeds give it the appearance of a greenish mud. As soon as a piece of ice of this kind attains a certain size, it is detached from the ground, and raised to the surface, by the greater specific gravity of the water; these masses, containing a quantity of gravel and weeds, unite and consolidate, and in a few hours the river becomes passable in sledges instead of in boats.

On the 24th of September everything was ready for the continuance of our journey in sledges. The dogs were weak and tired from scanty food, and we could only drive slowly, so that we did not reach the Iakut settlement of Potistennoie until the 28th. The above name, signifying five-cornered or five-walled, is taken from a large insulated rock, which by its five perpendicular sides of equal dimensions bears a

great resemblance to a five-cornered tower. We obtained here fresh dogs, and drove the same day to a village called Baskowo, where we found a few Russian families, who had not yet returned to Nijnei Kolymsk. From Brussanka to Baskowo, the banks of the stream are generally flat, with a few occasional sand-hills, which are continually undermined by the water. The whole district is a morass, interspersed with small lakes, with occasional low bushes and stunted larch-trees; a few taller trees are sometimes seen in places where the ground is a little raised. The whole district is remarkably uninteresting and dreary; we travelled through it for five days, and on the 29th of September we were glad to see Nijnei Kolymsk again, after an absence of seventy days. The nature of the country, and the lateness of the season, combined to render the latter half of our journey barren of interest.

It may be said of the inhabitants generally, that notwithstanding the influence of the Russians, they still preserve, in great measure, their original characteristics, both in their physical appearance, and in their disposition. Like most of the natives of the Polar Circle, they are short in stature, but broad-shouldered and muscular. Their hands and feet are very small, their heads are large in proportion to their bodies, the face is broad and flat, and the wide cheeks seem to press the mouth together and give it a roundish form. Their hair is black and coarse, and their small deep-seated eyes are dull and inanimate. Their whole outward form seems contracted by the severity of the climate, and the constant conflict with cold and hunger: and from the same causes, their moral and intellectual faculties appear as if but imperfectly developed.

CHAPTER X.

Survey of the Coast of the Polar Sea from the Lesser Tchukotski River to the mouth of the Indigirka, by the Mate Kosmin, in 1821.

I WAS directed by the commander of the expedition, to commence my survey from the village of Maloie Tchukotskie, to which place he accompanied me, and where we expected to meet guides and horses. It was not until the 1st of July that an Iakut arrived, bringing only five horses, which had been collected from the different settlements about 150 wersts off. My preparations were soon completed; the two strongest horses were loaded with provisions and other necessaries, and the three remaining ones were assigned to myself and my two companions, who were the above-mentioned Iakut and a young Cossack acquainted with the district. By the advice of the latter we took two light canoes for crossing the rivers. We started on the second of July at half-past eleven, with clouded weather, and with a temperature of + 49°.

The river Tchukotskia rises in a lake of the same name, ten wersts from the sea, and which is eighteen wersts long, and from seven to eight wersts broad. This lake is connected by a small arm with that of Bokowoie, of nearly the same size. About eight wersts from the eastern end of the Bokowoie lake, is that of Nerpitschie, nearly

fifteen wersts in length; from the western end of the latter lake flows the Ubiennaia, which joins the Kolyma near its mouth, while the Pochodskaia runs from the south-eastern end of the same lake, and empties itself also into the Kolyma higher up. These three rivers abound in fish, and are greatly regarded by the natives in consequence. The country in a W. N. W. direction from the mouth of the Tchukotskia is interspersed with lakes of various sizes, is flat, and scarcely raised above the level of the sea. We met with a large quantity of drift-wood, among which the horses stumbled and became frightened and unruly, one of the boats was broken to pieces, and the pack-horses got loose and shook off part of their loads. These circumstances made our days' march of only thirty-six wersts a very fatiguing one. We passed the night in a balagan, on the Ubiennaia, resorted to from Nijnei Kolymsk for fishing. Its latitude is 69° 37′, and its longitude 159° 27′ by reckoning.

Early in the morning of the 3rd of July we had violent wind and a thick fog. Snow fell in the evening with a temperature of + 29°; it had been + 35° in the morning. We followed the course of the Ubiennaia, which is N. 40° E. and slept 12½ wersts off at its mouth, in a bay of the same name. The wind was so high, that we could not venture to cross the bay in small boats; we had therefore to follow its windings until we came to the mouth of the Kon'kowaia, where we slept. During the latter part of this day's march, our horses had to wade up to their girths, as the violent N. E. winds had caused the sea to overflow the low coast for a considerable distance inland. Not far from the small elevation where we passed

the night, we found some fragments of a shipwrecked vessel, in the construction of which iron nails had been used. We were now by reckoning in latitude 69° 46′, and in longitude 159° 27′. In a N. 80° W. direction, and at a distance of about 13 wersts, we saw several Tunguse yourtes.

In the night of the 4th, the wind veered to the north, and brought with it thick masses of mist, which sometimes sunk, and sometimes rose again, but were never entirely dispersed, notwithstanding the violent gusts of wind. Though when morning broke the thermometer showed + 35°, yet we suffered much from cold, being completely wet through, and the storm and the damp atmosphere making it impossible to kindle a fire with the drift-wood, which was thoroughly saturated with sea-water. In the morning we found the ground about us, our horses, and even our own clothes, covered with a thin white finely crystallized crust of a salt flavour. I had subsequently several times occasion to observe, that during N. and N. W. winds, the ground becomes covered with crystals of salt. The horses appear to like them, and eat with avidity the dry hard grass when it is covered by them.

As the storm continued, and as the Kon'kowaia is here half a werst broad, we could not take our horses across it, and had to follow its course upwards for six wersts, when we came to a place where it was only 70 fathoms in width, and where we crossed without difficulty. But after passing the rapid stream safely, we met with a misfortune where we least expected it. We had returned to the coast and were crossing a shallow bay, when the Cossack's horse took fright, and threw his rider and two packages which contained my

journal and our store of tea and of ammunition. The tea, which was our only cordial, was spoilt, and the powder was rendered wholly unfit for use; the latter loss was the more important, as we expected to encounter bears very frequently, and we had no weapons left except the Iakut's bow, one hatchet, and a couple of knives.

Whilst the others were engaged in catching the horse, I rode to the Tungusian village before mentioned. It consisted of thirteen scattered yourtes, situated on some of the flat hills, called Iedoma, which occasionally break the uniformity of the Siberian tundras. The houses were built partly of wood and partly of bark, and were inhabited by thirty Tunguses and Iukahirs with their chiefs. They usually come here in the beginning of summer, i. e. in June, and remain about two months, for hunting, fishing, and fowling. In August, they travel along the coast in quest of stone-foxes and mammoth bones, and when the cold weather sets in, they return to the forests, and engage in the chase of the fur-animals. In December they assemble at Tchetyrech, on the Alaseia, to meet the Government Commissioner, and to pay him their jassak or tribute of furs, and to purchase tobacco, ammunition, and other things. During the remainder of the year, they wander over the tundras between the Kolyma and the Indigirka.

As I approached the yourtes I was met by the inhabitants, who took me at first for one of the Russian merchants, who occasionally travel through the country from Kolymsk to barter tobacco and brandy for furs. On learning who we were, they did not alter their intended kind reception of us. In return for our entertainment I gave them some of the wetted tea, which they

were much pleased with, and assisted me in drying the remainder. They gave us two new boats in place of the old ones, which were almost worn out.

I have nothing to add to the accounts which the other members of our expedition have given of the different races; but I may be permitted to remark that I regard the nomade Tunguses and Iukahirs as the happiest people in Siberia. They are not tied down to any spot, but wander as circumstances induce, always taking with them their families and their small possessions, and never feeling the grief of parting from a home. They scarcely seem to have any anxiety for the future, but cheerfully enjoy the present. The strong mutual attachment in families, and between friends, so rare among half-civilized people, and the purity of their manners, are really deserving of admiration.

The group of hills on which the Tungusian village is situated, extends eight or ten wersts to the west, where it increases in height, and turns in a N. E. direction towards the sea, forming a ridge of some elevation on the east side of the greater Tchukotskia river. One of the most important and productive of the numerous lakes scattered over the low lands of this district, is situated on the north side of these hills; the Mawrina flows from it. The Ostrownoie lake, on the south side of the hills, sends forth the Iakutka river, near which there is a summer balagan belonging to some of the citizens of Nijnei Kolymsk.

On the western declivity of the hills there is a large quantity of drift-wood, among which the Tungusians had found fragments of a vessel, which, from the irons nails adhering to it, appeared to be

of a different construction from the simple one in use here. We left this hospitable settlement on the 5th of July, at noon, and proceeded in a N. 27° E. direction. We followed the coast for twenty-six wersts, and halted for the night in 70° 00′ latitude and 159° 41′ longitude, by reckoning. The sea horizon was covered with ice and large hummocks, extending to within two wersts of the land, and we heard the usual thunder-like sound of the icebergs driven against each other, and on the shallows, by the violent north wind.

The morning of the 6th was misty, but towards noon the violent north-east wind dispersed the fog which had veiled the whole country. My thermometer showed + 35°. Still following the low-coast, we reached the Tchukotski promontory, on the western side of which we halted, in a balagan, near the greater Tchukots river. It is in latitude 70° 07′ and longitude 159° 39′. For a distance of ten wersts, in a N. 8° E. direction, the coast is low and flat, it then rises again, and forms the Tchukotski Cape, situated in 70° 07′ latitude and 159° 48′ longitude. The Cape is seventy-five feet high, with steep sides; a number of conical fragments, about twenty or twenty-five feet in height, are scattered at the foot. We found a lake on the summit, so completely frozen that we rode across it. Looking over the sea, we saw from E. to N. extensive fields of apparently solid ice and hummocks, but between S. and E. there was drifting ice. In the direction S. 5° W. the coast was low. I remarked an insulated hill bearing N. 8° E., which, as we advanced further, we perceived to be separated from the coast. It was Krestovoi, the first of the Bear Islands. The bay of Tchukotski, into which the river of the

same name empties itself, is four or five wersts across: its west shore is almost level with the sea.

Whilst I was engaged in surveying the shores of the bay, I sent the Cossack to measure the depth of water near the entrance; he brought back word that we might safely cross it; but, unluckily, he had not examined the bottom of the ford as well as its depth, and in trying the passage the foremost horse sunk so deep in the soft mud, that the night was far advanced before our efforts were successful in extricating him. We, of course, did not attempt the passage again, but halted for the night on the shore. As our provisions were rather low, we tried our net, but we caught only one fish.

On the 7th of July, as we could not hope to ford the bay, we ascended the river for nine wersts, and, having crossed it, we returned along its western bank to the sea-coast. The river enters the sea in a N. 70° E. course, is deep, has rather high banks, and a very rapid current. It forms the extreme northern boundary of the grazing-grounds of the citizens of Nijnei Kolymsk.

Still following the coast, we reached on the 8th of July Cape Krestovoi, which is, by reckoning, in 70° 17′ latitude, 159° 55′ longitude. It consists, like the Tchukotski Cape, of a greyish clay, and it rises sixty-five feet above the level of the sea. I could plainly discern from it Krestovoi Island, bearing N. 5° E. The sea-ice appeared solid for some distance, with numerous large hummocks. Six wersts from the cape, and N. 71° W. from it, begins a strip of land three wersts long, and only 200 fathoms broad, which divides a lake about seven wersts in length, and five or six in breadth, from the sea. This natural dam is hilly, and

consists like the two capes of grey clay. Further to the west, where the coast takes a N. 40° W. direction, it is intersected by several streams, and the soil consists of black vegetable earth. After riding thirteen wersts further, we came to a deep, though not very broad river, which I named Prokopii, after the saint of the day, and on the banks of which we passed the night.

Next day, about ten wersts further on, I found the ice near the coast covered with a kind of grain which at first sight closely resembled rye; I afterwards learnt that they were the seeds of the *Stipa pennata*, a grass which grows abundantly along the coast, and of which the seeds are carried great distances by the wind.

On the 9th of June, the sun just broke through the clouds, so as to admit of my taking a meridian altitude, which gave the latitude of our halting-place at the mouth of the Prokopii river 70° 28′. Its longitude by reckoning was 159° 43′; Krestovoi Island bore N. 20° E. We continued our route along the low coast in a N. 31° W. direction, and 4½ wersts from our sleeping-place we came to the mouth of the Agafonow River, which enters the sea in a course N. 60° E.: on its western shore there is a balagan. Fourteen wersts further on we halted near another river, having passed seven dried-up streams, where there was a quantity of drift-wood, amongst which I found fragments of a ship with iron bolts and nails, and a boat-oar, on which the green paint was still visible.

We continued our journey on the 10th of July, with a temperature of + 49°, and after proceeding six wersts along the coast in a N.W. direction, we came to an earthy promontory, only thirty-five feet high, forming the northern termination of a

range of low hills coming from the westward. We slept 5½ wersts further on, near the river Krestovaia, the mouth of which opens to the east, and is between seventy and eighty fathoms across. On the eastern bank of the river there are a balagan, a few ruined yourtes, and apparently very old crosses, from which the river is named. This point is situated in 70° 44′ latitude by my noon observation, and in 159° 15′ longitude by reckoning. The northern point of Krestovoi Island bore N. 59° E., the high hill upon the island bore N. 62° E., the south point of the island N. 66½° E., and Cape Krestovoi, S. 61° E. In the afternoon the weather cleared up completely, and I again saw the hill on the island bearing N. 58° E. from the point where we then were.

We were roused in the night by loud cries from one of the numerous broods of wild geese which covered the lakes; they had been terrified by the sight of a black bear, and sought refuge with us; our horses too came round us for the same reason. We made ready our few weapons, but the bear, apparently alarmed by the barking of a dog which accompanied us, returned to the tundra. This little adventure enabled us to kill a few of the frightened geese. On the morning of the 11th of July a thick fog circumscribed our horizon to a few fathoms, and as I was anxious to determine accurately the longitude of this place, and the position of the Bear Islands, I determined to wait a day, in hopes of better weather: our horses too stood in great need of rest. Next day the fog still continued, and a north wind covered the heavens with dark clouds, which promised snow rather than clear weather. I determined, therefore, to continue our journey, sooner than incur a longer and probably

fruitless delay. The temperature at noon was + 38°. After riding thirteen wersts, we came to the Baigatschowa river, and slept fourteen wersts further on, at the mouth of the Kuroshajina.* The latter river is deep, though only ten fathoms broad; it falls into the sea in a N. N. E. course. We saw here the remains of a hut built by M. Hedenström for fishing. This day's march was a very fatiguing one for our horses, as the flat coast had been overflowed by the sea, and their legs sunk deep in the soft soil.

On the 13th, the sky was still overcast, but towards noon, a fresh breeze from the east scattered the clouds, so that I was able to take an altitude of the sun near the meridian, by which I determined the latitude 70° 54′. By ten lunar distances I found the longitude 158° 56′: the longitude by reckoning was four miles to the west of the observed longitude. In the afternoon we proceeded along the coast, which followed a N. 60° W. direction, bending gradually to N. 70° W. Our day's march was twenty-eight wersts. The Kuroshagina is between one and one-and-a-half wersts broad, and empties itself into the sea by three outlets, two of which were almost dry. About ten wersts from the western bank of the river, there is a range of hills running in a N. W. direction at a distance of from three to seven wersts from the coast, and extending to the Kuropatosh river. The low flat strand, which scarcely rises above the level of the sea, consists of a hard greyish clay bearing a scanty growth of very thin grass, and covered with a crust of fine salt, and with small shells. A quantity of scattered feathers showed that great numbers of geese resort

* Kuradajina in the map.

here in the moulting season. We saw but little drift-wood, and that so rotten that it crumbled to pieces under the horses' hoofs; the water of some small lakes was quite black, apparently from the effect of the mouldering drift-wood which they contained.

We halted on the 13th near a considerable hill, to which I gave the name of the Northern Parnassus. I had an extensive sea-view from its summit. A row of hummocks ran parallel with the coast about six wersts from our encampment, and beyond them I saw floating fields of ice. A quantity of drift-wood among the hummocks was kept in constant motion by the waves, and by the pressure of the ice. The pieces of wood sometimes rising erect, and sometimes sinking again, had a very singular appearance. We killed here four geese and two divers.

Next day, (14th of July,) we had a clear sky and a light breeze from the south, and at noon the temperature was + 53°. I tried to dry some of our damaged powder, of which we felt the want more than ever, for provisions were getting low, and we could not hope to meet many moulting geese which we might be able to catch. A meridian altitude gave the latitude of the place 71° 01′, the longitude was 158° 10′ by reckoning, and the variation 10° 00′ E. In the afternoon we crossed five inconsiderable streams from the hills, and made twenty-eight wersts in a N. 89° W. direction. We had an opportunity of proving that we had succeeded in drying the powder by shooting a few geese. The Northern Parnassus bore S. 89° E.

The air continued soft and mild, and on the 15th the thermometer showed + 67°. The noon observations gave the latitude 71° 04′, and the

longitude 157° 23′. We arrived in the afternoon at the mouth of the greater Kuropatosh, which falls into the sea in a north direction, and is from 1½ to 2 wersts broad, but so shallow that our horses easily waded through it: our day's march was 31 wersts.

The range of hills mentioned above as running parallel with the coast, takes a S. W. direction from the Northern Parnassus, and terminates S. 23° E. from the mouth of the greater Kuropatosh. West of this river there rises towards the sea a high hill, the summit of which bore S. 80° W., distant seven wersts. Not far from it is a balagan, from whence the steep part of the coast called Kuropatosh Jar begins, and continues as far as the little Kuropatosh river. This perpendicular cliff consists, in great measure, of ice which never thaws, mixed with a little black earth and clay, amongst which are a few long thin roots of trees; and where the waves have rolled against the masses of ice, and have washed away the earthy particles, mammoth-bones may not unfrequently be seen.

On the 16th of July our observed latitude was 71° 04′, and our longitude by reckoning 156° 26′; the temperature at noon was between + 73° and + 74°. We followed the coast in a S. 60° W. direction; and after we had gone seventeen wersts we came to the Little Kuropatosh river, which enters the sea in a N. 50° E. course, and is about two wersts broad. This river flows between two ranges of hills; it washes the foot of the eastern range, but the western is four wersts from its present bed, and the whole valley appears to have been once occupied by the stream. We saw a balagan at the west side of the mouth of the river, but we did not halt until thirteen wersts further

on. The coast is low, and follows a S. 65° W. direction for 4½ wersts, after which it assumes a S. 52° W. direction, and rises to about thirty or thirty-five feet, consisting, like the shore already described, of ice, clay, and black earth. I drew out some of the insterpersed roots, and found them chiefly birch, and as fresh as if they had just been severed from the trees: the nearest woods are 100 wersts off; a low strip of fine sand at the foot of the cliff, was covered with partially weathered mammoth-bones. We saw no drift-wood.

On the 17th of July our observed latitude was 70° 57′, and our longitude by reckoning 155° 31′. The thermometer stood at + 69°. The warm weather of the last three days might well have made us forget the latitude, if the fields of ice which covered the sea, and the perpetually frozen ground beneath our feet had not reminded us of it. Three days before, we could not lay aside our thick winter garments, and now the lightest clothing seemed too warm. The sun had been constantly shining for the last seventy-two hours in the clear and cloudless sky. This was the last day that we saw it in its full magnificence, heightened by the refraction which the great evaporation from the sea produced. The size of its disk, its altitude, and its light, appeared to vary incessantly. One moment it seemed to contract, to assume an elliptical form, and to sink into the ocean; it would then suddenly rise again in full size and majesty, and float above the horizon in a flood of red or yellow light. This magnificent spectacle lasted throughout the day, nor could we refrain from gazing on it, notwithstanding the pain which the brilliant light caused

to our eyes. In the night of the 17th I measured with the sextant the apparent diameter of the sun, when on the meridian below the pole, and found it 37′ 15″ in a horizontal, and 28′ 20″ in a vertical direction.

We had followed the low coast in a course S. 65° W. for twelve wersts from our halting-place; it then bends suddenly to N. 82° W. We rode on for fifteen wersts further, and encamped for the night at the foot of a flat hill.

On the 18th of July, a few light clouds were visible near the horizon, and the sky above us was still, clear, and bright, but towards evening a strong wind rose from the north, bringing heavy clouds, and obliging us to have recourse to our furs again. My noon observation gave the latitude 70° 58′, and the longitude was 154° 45′. The direction of the coast S. 57° W. The ground was flat for some distance inland, with numerous small lakes and much drift-wood. During the day's march of 19½ wersts, we had to cross four rivers, of which the first and most considerable is the greater Konètschnaia; the next, distant two wersts, is the lesser Konètschnaia; the third, the name of which my companion did not know, is four wersts further; and the last is the Schkulewa, near which we halted for the night. These four rivers wind between low hills, and have steep banks; the three last enter the sea in a N.E. course. Two of the horses were so knocked up by their long and toilsome march that we were forced to distribute their loads among the rest, and my two companions had to go on foot.

On the 19th of July, the north wind increased in strength; it rained the whole morning, and at noon, notwithstanding a temperature of + 57°,

heavy snow fell. Our observed latitude was 70° 54′, the longitude by reckoning being 154° 13′. In the afternoon we pursued the line of coast S. 79° W. for nine wersts, then crossed a broad stream, and after going three and a half wersts further in a S. 69° W. direction, we came to the eastern arm of the Alaseia, called Lagoschkin. This deep and rapid stream follows a very winding course between steep banks, and before entering the sea, divides, so as to form at its embouchure an island two wersts in length, lying east and west. We crossed two wersts above the island, at a place where the water is 150 fathoms broad: three and a half wersts further on we crossed another arm of the Alaseia, the greater Alaseiskoi Protok, and halted for the night on its western bank.

Among all the rivers which enter the sea between the Kolyma and the Indigirka, the most important is the Aleseia. It rises in latitude 67° in the Alaseia mountains, and receives a number of tributaries, some of which flow from the mountains, and others from different large lakes. Its depth is considerable, it winds very much, and empties itself into the sea by five arms, of which the two above-mentioned are the largest; the other three, which are to the westward, having at all times much less water, and being frequently quite dry. The two eastern arms are divided from each other by an island twelve wersts long in a N.N.W. direction; the current of the Lagoschkin arm is rapid, and its mouth is two and a half wersts across. A sand-bank extends some distance into the sea from the point of land which forms the western limit of the embouchure. To our great joy we met near the Lagoschkin arm,

the Iakut chief Sosonow, with two followers and six horses, which he gave us instead of our own weary ones. He had come here from the nearest Iakut settlement, which is 150 wersts up the Alaseia, and had been expecting us for the last five days.

The 20th of July brought a return of clear, mild weather, with a gentle breeze from the E.N.E., and a temperature of + 56°. Our observed latitude was 70° 50′, and our longitude by reckoning 153° 43′. We were delighted with the addition of the society of two new persons to our own small party, and determined to spend the rest of the day here. We cast our nets, and caught six large salmon-trout, and above a score of smaller fish, with which we entertained our guests, and they helped us to repair our damaged harness and our two boats.

We resumed our journey with our fresh horses in the afternoon of the following day, after I had determined the longitude of our halting-place by means of ten lunar distances. I found it 153° 43′, and was satisfied as to the correctness of my previous reckoning. The variation was 10° E. After passing another arm of the Alaseia, thirteen wersts from our halting-place, we came to the mouth of the lesser Alaseiskoi, crossed it by a convenient ford, and slept on the other side. From this place the low coast takes a S. 70° W. direction, it is covered with drift-wood, amongst which a kind of slender grass grows.

On the 22nd of July the sky became overcast, with a strong breeze from the east, which towards evening shifted to the north, and brought with it a thick fog: the temperature at noon was + 53°, the observed latitude was 70° 49′, and the longitude dependent on the lunar distances taken the

day before, 153° 00′. We pursued the line of coast in a N. 87° W. direction, and arrived six wersts from our sleeping-place at the small river Bulgin, where the coast bends N. 81° W.; eleven and a-half wersts further on, we crossed another small stream, and after riding two wersts more, we came to the mouth of the river Bludnaia, which is nearly eighty fathoms broad, very rapid, and with remarkably steep banks.

As the wind was too violent to venture to cross in our small boats at this place, we traced the stream upwards for five and a half wersts, where we found it still covered with ice sufficiently solid to bear our weight; after going two and a half wersts further we crossed another arm in the same manner. After making eight wersts more in a S. 70° W. direction, we halted for the night at the mouth of the Uschiwaia, which opens to the north, and is by reckoning in latitude 70° 55′, and longitude 152° 15′.

The mouth of the Uschiwaia is from seventy to eighty fathoms broad; its depth is considerable, and its banks form terraces or steps. The stream is very rapid, and undermines the banks in such a manner that large masses of earth often fall in, and usually discover a quantity of mammoth-bones, of which the Iukahirs obtain a good supply every year. The whole of this part of the coast is generally rich in mammoth-bones. There are on the eastern side of the Uschiwaia, a balagan, a yourte, and a large wooden cross; the latter, the inhabitants of the banks of the Indigirka told me had been washed here by the sea, found by them among the drift-wood, and set up on its present site. There was an inscription upon it, but so effaced that I could only guess at single letters, and could not make out their sense.

On the 23d of July, still following the coast, we made twenty-six wersts in a W. by N. direction, and halted near the little river of Delakowaia. We had placed ourselves on a slight elevation, but the continuance of the north wind raised the level of the water so much, that we were twice in the night obliged to change our ground, and barely escaped being reached by the waves. Next morning the wind changed, the waters subsided, and we continued our journey as before, along the low coast, in a N. 45° W. direction. After five wersts we reached the easternmost arm of the Indigirka, called the Kolymskian outlet, Kolymskoi Protok. The strong north wind blowing over the immense fields of ice lowered the temperature so much that it was only + 33° at noon. In the evening the wind sunk a little, and we had rain.

Between the eastern continental bank and the island of Kolessowsk, the northern part of which was concealed by thick mist, the breadth of the Kolymskoi Protok is from two to three wersts. We followed its eastern bank for six wersts in a S. 52° W. direction, crossed the little river Propadschaia, and slept 5½ wersts further on near the mouth of the Bludnaia, in latitude 71° 00′, and longitude 151° 10′, both by reckoning.

The Bludnaia enters the Kolymskoi Protok, by two outlets, one called Malaia, (the little,) and the other Bolschaia, (the great,) Bludnaia. We found near the former three solitary yourtes belonging to a few families, who had settled here for the sake of fishing, and on account of the goodness of the pasture. I left here my tired horses under the care of a Iakut, to recruit their strength, and embarked in a boat with a Cossack and one of the people of the place, to visit the settlement of

Iedomka, sixty wersts off. Summer appeared to be very nearly at an end. On the 25th and 26th of July we had rain, hail, and snow, and on the latter day the thermometer showed + 34° at noon, and only + 30° in the evening.

Our boat was towed up the stream by four dogs, besides which, we had two oars, and whenever the windings of the river brought us before the wind, we put up a sail made of rein-deer skins. We were sixteen hours in reaching the small village of Iedomka, situated in 70° 56′ latitude, and 151° 06′ longitude, on a rising ground near the junction of the Petrowaia and the Kolymskoi Protok. The inhabitants were absent on fishing and hunting excursions: winter was visibly approaching; the whole plain was covered with snow, which increased at night to a depth of six inches. We halted here, and were visited in the evening by an old man, who had just arrived in the hopes of finding some of the inhabitants, and of purchasing fron them a little tobacco, which they occasionally obtain from travelling Russian traders, in exchange for furs or fish. We were much gratified by this addition to our society; our visitor was made happy by a small present of tobacco, which he had not enjoyed for a long time; and we passed a very pleasant evening together. He volunteered to accompany us next day to the mouth of the Russkaia, and gave me by the way much valuable information respecting the various arms and tributaries of the Indigirka. He also related me to his own history, which appeared a rather remarkable one.

Kotchewtchikov, who was now eighty years of age, was born at Kirensk. At the age of fifteen he accompanied his elder brother on a voyage

down the Lena. It was one of those migrations in search of fortune, without any definite object in view, which used formerly to be more frequent than they now are, amongst the inhabitants of a land which offers few charms to foster strong local attachments. Several families often joined in an expedition of this nature. On the present occasion the party consisted of forty persons, men, women, and children; they descended the Lena in the hopes of bettering their condition, under the conduct of a citizen of Kirensk named Afonassii, in a vessel built by himself. They passed two winters in desert wastes, where they lived on fish and wild geese, and collected a large quantity of mammoth-bones. More than half the party, including the leader Afonassii, died in the course of the second winter. The elder Kotchewtchikov, being the most experienced navigator among them, succeeded to the conduct of the survivors. A little before the beginning of the third winter they arrived at the Polar Sea, and navigated along its shores for some time, struggling with countless sufferings and dangers, until they were shipwrecked at the mouth of the Indigirka. The vessel was completely destroyed. The two brothers parted from their companions and went inland, carrying with them their share of the few things which had been saved. As winter had now begun, they built a hut near a river where they found much fish. The place where they had settled, was only fifty wersts from Iedomka, but they never met any of its inhabitants, and during the whole winter they neither saw any of their fellow-travellers, nor any of the natives of the country. They feared being visited by the latter, having heard much of their rapacious and murderous disposi-

tion, and when, in the following summer, they one day saw two men approaching their hut, they actually determined to kill them. Happily, before they could execute their purpose, they discovered that the strangers were Russians, and fortune-hunters like themselves. They then received them with hospitality, and were finally persuaded by them to leave their solitude, and to embark with them for the purpose of ascending the Indigirka, but on the third night the two brothers secretly left the boat, and stole back to their hut.

When I asked the reason of their flight, as their previous life could not have been an agreeable one, and as they might have hoped that this opportunity would have enabled them to have reached their home, the old man told me that when two wandering parties came together in this way, the custom was, that on the first valuable discovery or successful hunt, a combat should decide to whom the prize should belong on that and on all subsequent occasions; the vanquished party became in such case in some degree servants or slaves to the conquerors, and were usually treated by them with much severity. As the two strangers were both powerful men, and in full health and vigour, whereas they were themselves worn down by long-continued privation and hardships, they were not disposed to await and abide by the law of the strongest, but preferred returning to their wilderness, where they passed another year and half. In the fifth winter, during a distant hunting-excursion, they came to a small village called Ruskoie Ustie, where fifteen Russians had been settled for some time. Being at length tired of solitude and of wandering, the two brothers joined the little colony, and remained with them en-

tirely; they never heard anything more of their original associates.

The old man was so pleased to find an auditor to whom his account was a novelty, that he had not finished his story when we arrived on the 27th of July at the village of Stantschik.

This little settlement, consisting of one boarded house, one yourte, one large tent of rein-deer skins, and a couple of sheds, presented a scene of great animation. The inhabitants of Iedomka had determined to leave their own village, on account of the failure of drift-wood, and were engaged in removing their houses and all their goods to Stantschik, where wood was plentiful, and where the fishery was more productive, as it is near the junction of the Lundshin with the Kolymskoi Protok, which abounds in fish. Stantschik is in 70° 51′ latitude and 150° 12′ longitude.

We continued our voyage next morning (28th July) with a moderate breeze from the north, and a temperature of + 40°, and after twenty-three hours we found ourselves at the above-mentioned village of Russkoie Ustje, where we were hospitably entertained by old Kotchewtchiko. As I found myself very tolerably situated here, I determined to remain till the middle of September, to arrange my papers relating to the survey; and at the commencement of winter to begin my homeward journey in sledges and on horseback, by the straightest and shortest road. I availed myself of every clear day for excursions in the neighbourhood, and for astronomical and other observations. By six meridian altitudes of the sun, the latitude of Russkoie Ustie is 71° 00′ 19″; its longitude by 78 lunar distances, divided into 10 sets, 149° 30′ 53″. The variation by single

azimuths, 9° 53′, and by corresponding azimuths 10° 00′. Mean, 9° 58′.

This little settlement, consisting of only a few houses or huts, is situate on the western bank of the western arm of the Indigirka, called, as well as the village itself, Russkoie Ustie, or the Russian mouth.

Two wersts in a S. S. W. direction, there is another village, called Ust'Ielon, on a river of the same name, flowing E. N. E.; the upper part of this stream is called by the Iakuts Biuriuloch.

The inhabitants of the three settlements, Iedomka, Russkoie Ustie, and Ust'Ielon, are all Russians, and are classed under the general denomination of dwellers on the Indigirka. At the last census, the number of males was 108. Their employments are fishing, hunting, and collecting mammoth-bones; the fishing is only for their own food. They take a great number of stone-foxes in traps along the coast, and sell the skins, as well as mammoth-bones, to travelling traders. In order to avoid disputes as to the hunting-rights of the three settlements, it is arranged that the hunting-grounds of the inhabitants of Iedomka shall extend from that place to the Kuros'hagina; and that those of the people of the two other villages shall range from the mouth of the Iana to the Kondratieva; and those limits are conscientiously respected in setting the traps. In summer, only the women and children remain to look after the fisheries, whilst the men disperse over the tundras with dogs and small boats, in pursuit of rein-deer and wild geese, and in search of mammoth's-teeth and bones; they collect the latter into heaps, distinguished by the name of the proprietor, and leave them in this manner in

the tundra, until they fetch them with sledges in the winter; and, much to the honour of these apparently imperfectly civilized men, a marked heap is considered quite safe, and has never been known to be touched by another of the hunters.

From the accounts which I received, swans and geese appear to resort, in the moulting season, to the banks of the Indigirka in far larger numbers than to those of the Kolyma, but the fish of the latter river are more plentiful, and better in quality than those of the Indigirka. The lakes of this district abound with a species of fish known here by the name of Krasnaia ryba, (red fish) which, however, must not be confounded with the sturgeon, called by the same name in Russia. The people of the Indigirka are more industrious than those who live along the banks of the Kolyma, but the latter are more advantageously situated for disposing of the little property they obtain, as the Iakutsk merchants, who travel through their country, buy their furs from them direct, either for money or for goods; and there is some degree of competition which ensures tolerably fair prices; but no one passes through the country on the lower Indigirka, and they can only sell to the very few speculators from Iakutsk or Kolymsk who are tempted to take a long and laborious journey in hopes of an enormous profit. In dealing with these monopolists the inhabitants are obliged to accept excessively low prices for valuable commodities, and it is only in this way that they can obtain a few indispensable articles of clothing and fishing-nets. The want of nets frequently prevents them from obtaining the necessary supplies of fish, and notwithstanding their industry and the quantity of furs and of

mammoth-bones which they obtain, they often suffer severely.

In the neighbourhood of Russkoie Ustie there are many traces of former large settlements, concerning which I could obtain no certain information. According to a rather general tradition, it would appear that the numerous and powerful tribe called Omoki, had lived here for a time, and had then removed to the westward, where, however, I am not aware that any traces of them have been found. When the present Russian settlers first arrived here, they found near all the rivers which join the Indigirka numerous ruined yourtes and mud-huts with fire-places. Stone-hatchets, and remains of weapons totally different from those now in use, are still occasionally picked up, so that there can be no doubt of this district having been formerly inhabited by a population who have now disappeared.

I was visited during my stay by the few inhabitants of the neighbouring villages, who brought me presents of what they consider their greatest delicacy, the fat of the back of the rein-deer. I gave them in return a small quantity of tea and tobacco, with which they were greatly pleased.

On the 2nd of September, floating ice appeared in the Indigirka, and on the 5th the river could be passed in sledges.

On the 23rd of September, Lieutenant Anjou, the chief of the Ustiansk expedition arrived, having completed his survey of the coast of the Polar Sea, from the mouth of the Iana to Russkoie Ustie. My own survey of the coast, from the mouth of the Kolyma to the eastern arm of the Indigirka, was now ready, and I began to prepare for my return. The coast-route, which I

had travelled in the summer, was ill-suited for a journey at the present season, as the intense frost renders the snow near the sea so hard, that the horses cannot scrape it away to get at the grass beneath. I determined, both on this account, and also because it was the shortest road, to go straight across the tundra, and on the 26th of September I began my journey with sledges drawn by dogs, which took me in two days to Iedomka. I then crossed the waste and uninhabited tundra on horseback to the Iakut settlements on the Alaseia, where I obtained fresh horses, and on the 6th of October arrived at Nijnei Kolymsk.

Nothing deserving of remark occurred during this journey, which lasted ten days. We encountered on the tundra many large troops of wolves, which alarmed our horses very much, particularly at night, so that we were obliged to keep watch by turns. We drove one troop away from a reindeer, which they were devouring, and which fell into our hands very opportunely, as our whole stock of provisions was reduced to a very few biscuits.

CHAPTER XI.

Third Journey on the Ice of the Polar Sea.—Preparations.—Mortality among the Dogs.—Departure from Nijnei Kolymsk.—Journey towards the North.—Waves of Drifted Snow.—Encounters with White Bears.—Deposit of Provisions.—Difficulties.—Accident.—High Hummocks.—Second Deposit of Provisions.—The Expedition divided.—False Appearances of Land.—Return to the Deposits of Provisions.—The Expedition re-united.—Proceed Northward again.—Easter.—Breaking up of the Ice.—Hummocks.—Turn to the Eastward.—State of the Ice.—Cape Chelagskoi.—Arrival at the First Deposit of Provisions.—Return to the Coast.—Pochodsk.—Famine.—Arrival at Nijnei Kolymsk.—Inundation.

The short summer of 1821, which to the inhabitants of Nijnei Kolymsk had been marked by so many failures in the produce both of the fisheries and the chase, was succeeded by a long winter of suffering. Our own position was a painful one, unable as were to relieve the general distress. To the want of provisions was added a new misfortune, hitherto almost unknown in this district, namely, a wide-spreading malady amongst the dogs. This disease had shown itself during the summer on the banks of the Lena, the Iana,

and the Indigirka. Very soon after the beginning of winter it reached the banks of the Kolyma. As our intended journey over the ice depended on our having the ninety-six dogs required for eight sledges, I sought anxiously to adopt such precautions as might secure those we obtained from infection. Orders were given to procure as quickly as possible at least a hundred healthy dogs, and to take them immediately to the greater and lesser Tchukotski rivers, to be kept there at the expense of the expedition, cutting off all communication with the neighbouring district. Part of our provisions had also to be conveyed to the store-house, which had been built near the Baranicha river. But whilst we were endeavouring to execute these plans, the malady spread so rapidly that we had the utmost difficulty in obtaining thirty-six dogs instead of the required ninety-six; and though they were instantly sent away, they almost all died. The mortality increased daily with the increasing intensity of the cold, and it soon extended to all the villages and settlements in the Kolymsk district. The inhabitants felt the loss of these valuable and almost indispensable servants more acutely than they did the scarcity, to occasional returns of which, they are in great measure accustomed and resigned. Such was the unhappy state of things at the opening of a new year (1822). As the time of our departure was near, I gave up all hopes of procuring more dogs in our own district, and sent one of the most trustworthy of the Cossacks to the Indigirka, where the sickness did not prevail, with a commission to purchase sixty, and to keep them in readiness until further orders near the greater Tchukotski river, feeding them well. On the 5th of March I re-

ceived information from him that he had found it impossible to collect more than forty-five good dogs, with which he awaited me at the appointed place.

As the intensity of the cold diminished, the sickness gradually abated, until at last it entirely subsided; but not until the inhabitants had lost four-fifths of their dogs. Most of those which survived were the property of the Cossacks, who, on seeing the difficulty in which I found myself relatively to the journey which it was our duty to make, came forward of their own accord, and in conjunction with some of the citizens, most generously volunteered to fit out twenty sledges, with twelve dogs each. We had now nearly three hundred, including those at the Tchukotski river, but there were not more than sixty amongst them which we could depend upon for a distant journey; the rest were all so weak as to be almost unserviceable. I was obliged, therefore, materially to alter my original plan, which had been to form the expedition into two divisions. This was necessarily given up, as well as the intention of beginning our journey over the ice from the mouth of the great Baranicha, where a large hut and a store had been constructed, as before mentioned. The store was empty, as it had been barely possible, for want of dogs, to convey provisions as far as Sucharnoie.

Every thing was at length ready for our departure, the sledges being loaded with dried and frozen fish, and other necessaries; and we left Nijnei Kolymsk on the 10th of March. My companions were MM. Matiuschkin and Kosmin, and the sailor Nechoroschkow. Dr. Kyber was bent on accompanying us, notwithstanding his weak state of health, and actually set off with us; but in spite

of all his efforts, he found himself obliged to return from Sucharnoie on the 14th.

We had only five proper travelling-sledges, with teams of dogs fit for the whole journey; the remaining nineteen sledges carried provisions, and were to return as soon as empty. One of the drivers was to serve as interpreter to the Tchuktches.

We reached Sucharnoie on the 12th of March, and spent the 13th in necessary preparations. We took provisions for ourselves for forty days, and for the dogs for thirty-five days, and began our journey over the ice on the 14th. On the 15th we reached the greater Baranov Rock, where we took up as much drift-wood as we could add to our loads. Unluckily we found only larch, which is heavy in carriage, and burns quickly. Having become aware of this on our previous journeys, I had had a store of birch-wood brought from the two Aniui rivers to Nijnei Kolymsk, and dried to make it lighter. We had enough for fifteen days consumption, besides four pood of train-oil, which would serve for ten days more. Altogether we had fuel for nearly forty days, but our sledges were rather heavily laden in consequence.

On the 16th we drove northwards with a strong breeze from the east, dark weather and snow. The N. N. W. sides of the greater Baranov Rock, which are washed by the waves, consist of perpendicular slate-rocks, six fathoms in height, and occasionally broken by a few ravines. After going eight wersts, we found ourselves at the most northern point of the rock, where a few insulated pillars give the appearance of a ruined castle.

From this point we took our course straight across the sea, in a N. 30° E. direction. It appeared to me that the object of our journey would

be best answered by proceeding to the N. E., until we should come to 71½° lat. in the meridian of Cape Chelagskoi, and 150 wersts distant from that promontory. I then proposed to form a deposit of provisions, to send back the empty sledges, and with the remainder to pursue my researches to the east, north, and north-west. In this manner our present journey would form a continuation of that of the preceding year, and we might hope for a satisfactory conclusion in respect to the existence or non-existence of the problematical northern land.

About one werst and a-half from the shore, we came to a considerable group of irregular hummocks, and after driving among them for eighteen wersts, we halted; not that we required rest, but in order to repair two of the travelling-sledges which had been injured, and to wait for the provision-sledges, which did not come up with us till late in the night, and then in a very bad condition. They had been so much damaged in passing the hummocks, that we were obliged to expend a large part of our store of birchwood in mending them. This unsatisfactory work occupied us during the whole of the following day, and we could not continue our journey until 11 o'clock on the 18th. We had heavy snow, a cutting N.W. wind, and a temperature of + 2°. The hummocks diminished in size and number, and at last ceased entirely: but in their stead we found a large plain crossed by immense waves or ridges of snow, and though the sledges suffered much less on the soft snow than among the hummocks, our dogs were wearied by having continually to ascend and descend. The height of these drifted waves of snow, which was two fathoms and upwards, showed

that a great deal of snow must have fallen, and that east winds had chiefly prevailed.

By the noon observation we were in 69° 56′ latitude; our longitude by reckoning was 0° 14′ east of the great Baranov Rock. Our day's march on the 18th, was only twenty-three wersts, chiefly from the delays occasioned by the provision-sledges. On the other hand we succeeded in killing a large white bear, whose flesh was very acceptable to the dogs. In the night the temperature fell to —24°, and continued the same throughout the 19th, but there being very little wind, it was endurable. Towards noon the weather cleared, and we saw the greater Baranov, distant forty wersts, bearing S. 11° W.

The next day we accomplished eighteen wersts, between 9 A. M. and noon. The noon observation made the latitude 70° 12′, and the longitude by reckoning 0° 50′ E. from the greater Baranov Rock. After completing thirty-six wersts, we were obliged to halt earlier than usual, on account of the violent N. W. wind, and thick drifting snow. Our sixteen provision-sledges (we had emptied and sent back three) were as usual behind, and it was not till late at night that fourteen of them came in, but the drivers were unable to tell us any thing of the two which were still missing. My uneasiness on account of the two drivers was increased, by knowing that a number of white bears were roaming about; one even broke into our camp in the course of the night, but was immediately killed. As soon as the day dawned we were on the look-out for our missing sledges; at length they arrived, and the men told us that having lost sight of their companions in the thick snow-drift, they were obliged to halt where they

were; that they had suffered much from the severity of the cold, having neither fire nor food, and had passed the night in constant fear of the bears, which happily, however, had been deterred from attacking them, by their shouts, and by the barking of their dogs. We deposited part of our provisions in the ice at this place, and sent back three more empty sledges.

The N. W. wind became still more violent, and the snow-drift thicker. The thermometer showed —9°. Notwithstanding the badness of the day, we were able to obtain an observation at noon, which made our latitude 70° 19′; our longitude was by reckoning 1° 6′ E. of the greater Baranov Rock.

On the 21st the wind abated, and veered to the east, but the sky was still overcast, and the thermometer showed —11°. At 10 A. M. we continued our route to the north-east among hummocks; the noon observation gave 70° 26′ latitude, and 1° 22′ east of the Baranov. In the afternoon we killed a bear which had followed us, and had wounded three of our best dogs. Some of the sledge-drivers were so tired of our meagre fare, that they made up their minds to try some slices of the bear's meat, notwithstanding the aversion generally entertained for it in the country. They assured us that they found it very palatable. At night we had a violent east wind, and a temperature of —24°.

On the 22nd of March we continued our route, after repairing our sledges, which had been damaged among the hummocks; the noon observation gave the latitude 70° 39′, and the longitude by reckoning 1° 51′ east of the greater Baranov Rock. By our portable azimuth compass, the

variation was 14½° E. The deep snow and large hummocks impeded us so much, that we could only accomplish fourteen wersts before night-fall, when the wind and snow-drift became more and more violent, and the provision-sledges, which did not arrive until six hours later, probably owed their safety to the drivers having obeyed the repeated orders which had been given, to keep close together so as to be able to assist each other.

On the 23rd, to our great joy, we had the warm wind, mentioned in an earlier chapter, with a clear sky, and the thermometer soon rose to + 35°. We hastened to avail ourselves of such a favourable change, by drying our tent, harness, bedding, and clothes of every description.

Meanwhile, M. von Matiuschkin went forward with two sledges to examine whether the difficulties in the north-east direction abated. He brought back word, that on the contrary the hummocks increased in size and number, but that there appeared to be an opening to the west, and we therefore proceeded in that direction; our noon latitude was 70° 42′, and our longitude 1° 51′ E. by reckoning. We soon came again to bad hummocks, amongst which we met with constant accidents; the traces of my sledge broke just when it had attained the summit of one of the highest hummocks; the dogs flew down the steep declivity, leaving the sledge and myself at the top. Unluckily, at the foot of the hill, they came upon a fresh bear's track, and followed it notwithstanding our cries, until they were stopped by the broken traces which they dragged after them becoming entangled in some blocks of ice; but for this fortunate occurrence, we should pro-

bably have lost them altogether, and have been in great difficulties in consequence: after a long chase we found them four wersts from the place where they had left the sledge, and quite exhausted by the efforts which they had made to free themselves.

Though we had advanced but six wersts, we were forced to halt under the shelter of a large block of ice. A long range of elevated hummocks extended to the S. E.; our provision-sledges were as usual much behind, and it took them ten hours to get over the six wersts. We had much wind from the S. W. during the night, but it abated towards morning. We started on the morning of the 24th, with a clouded sky, and a temperature of + 7°: about noon snow fell; our difficulties this day were greater than ever, we had to break our way with crow-bars across higher and more rugged hummocks than any we had before met with. The ice of which they were formed, was very solid, and had a knotty appearance; the hummocks were covered in many places with blue clay and gravel. In spite of the greatest care, the sledges were frequently overset; sometimes sliding down the smooth summits, and being precipitated into the narrow ravines, from which we only extricated them with the greatest difficulty. The efforts of both men and dogs were taxed to the utmost, and all of us were hurt by falls. As the provision-sledges had suffered most, and always caused the greatest delay, I determined to send them home from this place, and to deposit in the ice the provisions which they had carried. We excavated receptacles for these with great care, and closed them up with thick blocks of ice, filling up all the crevices with snow, and pouring

water over the whole, so as to form it into a solid mass, which could not be disturbed by the bears. When this was done, we proceeded to mend the sledges, which stood greatly in need of it; but the joy of the drivers, at being permitted to return home, was so great, that fatigued as they were, they sung over their work, which they completed with extraordinary rapidity.

The 25th was spent in these employments. Towards evening the horizon cleared a little, and we saw two mountain-like elevations. One, which bore S. 19° W., I considered to be the greater Baranov Rock, distant by reckoning 130 wersts: the other bore S. 5° W., but whether both were really mountains, I cannot be sure. On determining our present position by the bearing of the one supposed to be the Baranov Rock, it was found to agree with our reckoning, and it appeared that were now thirty wersts to the east of the most eastern point of our previous ice-journey. On the morning of the 26th, the thirteen sledges began their return to Nijnei Kolymsk. I had sent M. von Matiuschkin the day before with two sledges and provisions for five days, to look for a way by which we might penetrate to the north-east, and I now went northwards with M. Kosmin, taking three sledges and provisions for three days. As it was arranged that we should all meet here again on the 29th, the large tent was left on the spot till our return. We took first a N. W. direction, in which the hummocks were smaller and less compact. When we had gone fourteen wersts, the noon observation gave the latitude 70° 52′; the longitude was 1° 56′ E. of the Baranov Rock, by reckoning. The hummocks of old ice gradually diminished in number, and further to the

north, we came to another group consisting of more recent ice; these had been formed by the packing of drift-ice in the winter, and were distinguished by a greenish-blue colour.

We found here a strip of ice bare of snow, running along the margin of a new crack, in a W. N. W. direction. Having driven five wersts on this smooth pathway, we were astonished by falling in with old sledge-tracks, which on examination we recognised as those of our journey in the preceding winter. As by our reckoning we were thirty-five wersts from our last year's route, it is probable that the N. W. wind, which prevails throughout the summer, had caused the whole field to drift thus far to the eastward.

We accomplished this day fifty-one wersts, among recent hummocks, meeting occasionally with a few old ones, the sides of which were often partially covered with gravel and sand; the evening and night were clear; the temperature was —13°, with a gentle breeze from the S. E.; we had hummocks around us on every side.

On the 27th our noon latitude was 71° 13′, our longitude by reckoning 2° 13′ E. of the greater Baranov Rock; variation, 15° E. During the observation, M. Kosmin thought that from the summit of one of the highest hummocks, he saw two hills to the north-east; our attention being directed to them, they appeared clearly as two dark-blue mountainous hills, sometimes visible, and sometimes obscured; the highest of the two bore N. 40° E.; opinions were divided in respect to them; M. Kosmin and I considered that it was land, but the sledge-drivers regarded it as one of the optical illusions which have been already spoken of. We drove on in a N. 40° E. direction,

and when we had gone about a werst, we came to a piece of nearly rotten wood embedded in the ice. The further we advanced the clearer the hills appeared, presenting the aspect of a hilly country of moderate elevation, at no great distance from us; we could plainly distinguish, as we supposed, the valleys between the hills, and even several single rocks; every thing confirmed us in the hope of having reached the long-sought-for land, the object of all our toils. We hastened forwards amidst mutual congratulations, but as the evening light altered, we suddenly saw our newly-discovered land move 40° to windward, and extend itself along the horizon, until we appeared to be in a lake quite surrounded by mountains.

We halted for the night, full of disappointment, after a day's journey of forty wersts; we had a sharp E. N. E. wind, with a temperature of — 4°. Next day, the 28th, we had a repetition of the optical illusion by which we had been deceived on the preceding day.

After going eleven wersts and a-half, in a N. N. W. direction, we found our latitude, by the noon observation, 71° 34′, our longitude being 2° 50′ E. of the greater Baranov Rock by reckoning, variation 17° E. The hummocks did not appear to diminish, and it was time to return to the spot where we were to meet M. von Matiuschkin. We travelled faster in returning, partly because the dogs always run better and quicker over a track with which they are acquainted, and partly because some of the worst places had been smoothed in our previous passage; we had returned fifty wersts before sun-set.

On the 29th, an easterly breeze rendered the atmosphere moist, the thermometer stood at

+ 12°. We saw several tracks of bears, and of their parasites, the stone-foxes. Late in the evening we arrived at the place where we had deposited our provisions, and found M. von Matiuschkin awaiting us. He had made ninety wersts, in a N.E. direction, in three days, and had reached 71° 10′ latitude in the meridian of Sand Cape; he had met with fewer obstacles than before, but had still found many difficulties, particularly from the large quantity of deep snow, in which the dogs and sledges sunk sometimes entirely. He too had been deceived by the appearance of land on the horizon; besides the tracks of stone-foxes he had seen that of a red-fox, a singular circumstance at such a distance from land.

The sledge-driver, who was to serve us as interpreter, if we should meet with Tchuktches, was attacked with violent cramps in the stomach. Fortunately we had with us a Iukahir, who was considered a surgeon on the banks of the Omolon, and who always carried a lancet. He was proud of being consulted, and decided that it would be right to open a vein, which he did with much expertness; whether this contributed to the patient's amendment or not, the pain subsided. We remained where we were for a day, to allow him to recover strength. We all suffered, as before, from inflammation of the eyes, which was mitigated, in some degree, by the use of black crape veils and spectacles, and by gently rubbing the eyes with spirits. Whilst our patient was resting, we occupied ourselves in taking provisions for twenty days from the deposit, and packing them on the sledges.

We resumed our journey on the 31st of March,

at 2 P.M., in a north direction, which appeared to present rather fewer difficulties than the north-eastern one; however, we only made twelve wersts before night. The evening and the night were perfectly calm with a clouded sky, but next morning (1st April) an east-wind, which veered in the afternoon to the south, drove away the clouds. We could only accomplish twenty wersts, being always obliged to walk, and frequently to assist the dogs in drawing the sledges.

We rested on the 2nd of April, being Easter-day; double rations were issued to every individual: the mildness of the weather, and the bright sun-shine added still further to the refreshment and cheerfulness of the day.

The bright mild weather continued on the 3rd, but large and numerous hummocks prevented us from accomplishing more than eighteen wersts. Two of the drivers were hurt by the oversetting of their sledges, and one of our best dogs was killed: we met with numerous other accidents, and on the 4th of April, after travelling thirteen wersts, we were obliged to halt to repair our sledges. The runners of three of them had been broken among the hummocks, and had to be replaced by some of the birch-wood which we carried with us, and which we found very useful for this purpose.

After repairing damages as well as we could, we continued our route on the 5th of April. It led across a plain of ice covered with crystals of salt. We saw a seal lying near a hole in the ice, but he escaped us. We found the ice nearly four feet thick, the depth of water twelve fathoms, and the bottom greenish mud. The temperature of the water was + 29°, that of the air + 25°. We found a current setting from W. N. W. to E. S. E.

After a march of nineteen wersts we halted for the night, and kept a more careful watch than usual, as we had seen numerous tracks of stone-foxes and bears, and we wished to avoid a nocturnal surprise by the latter. During the day we had a fresh breeze from the east, and a thick fog, which thoroughly wetted our tent and clothes, and covered them with rime.

On the afternoon of the 6th of April, after toiling through thirty wersts, we found ourselves at the point where M. Kosmin and I had turned back on the 28th of March, so that it had taken seven days to accomplish the distance which we had then travelled in 2½ days when our sledges were lighter. Before halting for the night we went 9½ wersts further; the hummocks had latterly increased both in number and in height; many of them were of the class of old hummocks, and were very difficult to pass, chiefly on account of the deep snow which filled the intervals between them. The exertions of the sledge-drivers in particular were very great. Our interpreter was again attacked by severe cramp in the stomach. Being totally unable to procure for him any other assistance than the lancet of the Iukahir, to which it did not appear prudent to resort a second time, our anxiety on his account was very great. It was, moreover, evident, that whilst we could do nothing to relieve him he would probably cause us long and frequent delay. Under all the circumstances, I determined on sending him back to the Kolyma, though we were 250 wersts from land, and 390 wersts from the nearest inhabited place. We could ill spare either men or dogs; still it appeared the least evil to despatch the patient with two companions to take care of him, on one

of the best sledges, drawn by twenty-four instead of twelve dogs. This double team left one sledge without any dogs: I had it broken up, and used the pieces in repairing the others. We buried the stores which we were unable to carry, in the ice, against our return, together with a few other things which we thought it possible to dispense with. Our load was still further lightened by giving our tent to the returning sledge for the use of the sick man: we ourselves retaining only two pologi, or small summer travelling-tents. Our party was now reduced to six persons with three sledges.

On the morning of the 7th of April a breeze from the north dispersed the thick mist which had gathered round us the night before, but it returned in the afternoon; the temperature was + 21°.

After only three wersts tolerably smooth travelling we found ourselves in a fresh labyrinth of hummocks. In vain we looked from the summit of the highest for some outlet: we were forced to open a path for ourselves by means of crow-bars: five hours' toil brought us through the worst difficulties, and we were able to advance thirteen wersts further, still amongst hummocks of different sizes, partly of old, and partly of recent formation: two of the sledges were much injured, and in consequence I did not arrive at the little camp till late in the night.

On the 8th we travelled two wersts among crowded hummocks, and five and a half wersts over a flat surface covered with salt crystals, bounded on the north by masses of ice of recent fracture, running from east to west. We had an extensive prospect from their summit. To the

north we saw several parallel ranges of recent hummocks of a greenish colour: they resembled the towering waves of the ocean when violently agitated by a storm. To the south, beyond the flat surface which we had crossed, and which looked like a wide river running between cliffs of ice, we saw high snow-covered hummocks of old formation, which by their inequalities, gave to that part of the sea the appearance of a country intersected by deep hollows and ravines.

The contrast, between the southern *old* hummocks and the northern *recent* hummocks, was too striking for us to doubt that we had reached the extreme limit of the shore-ice of the continent, and that we had before us a sea not bounded by land to the north, at least within a considerable distance. We passed two groups of the recent hummocks and halted for the night amongst a third group. We had met with several wide fissures, where we had found $14\frac{1}{2}$ fathoms, and a bottom of green mud. We again buried part of our provisions, that we might be enabled to press forward to the north more rapidly.

On the 9th of April, we had a clear sky, a moderate breeze from the E., and a temperature of + 9°. The noon observation gave the latitude 71° 50′, the longitude by reckoning was 3° 20′ E. of the greater Baranov Rock. Variation $18\frac{3}{4}$° E.

After crossing the ridge behind which we had passed the night, we found ourselves in the midst of one of the wildest groups of hummocks which we had ever seen, and in which, after working seven hours with crow-bars, we had advanced only three wersts. As there appeared no end to our labour in this chaos of ice, and as the exhausted state of the dogs, and the dilapidated

condition of the sledges, threatened us daily with their entire loss, I held a council with the two officers who accompanied me, requesting them to give me their opinion, whether, under present circumstances, they saw any possibility of our making any material advance. They both said that even if we should not be stopped by open water, still in the exhausted state of our dogs, we could scarcely accomplish thirty wersts in a week across these rugged hummocks.

Perfectly coinciding in this opinion, I determined to return; but that we might have nothing to reproach ourselves with, I sent M. von Matiuschkin, on whose zeal and conscientiousness I had the most entire reliance, in an unloaded sledge with two companions, to examine the ice to the north, in order to ascertain whether it was actually impossible for us to proceed. He went on the 10th of April; we had had a moderate breeze during the night, and had heard the sound of the ice-fields breaking up. In the morning we had a sharp breeze from the north, and the thermometer showed + 14°.

Whilst M. von Matiuschkin was absent, I determined the latitude 71° 52′, and the variation 18° 45′ E. Our longitude by reckoning was 3° 23′ E. of the Baranov. We had fourteen fathoms and a-half water with green mud.

At the end of six hours, M. von Matiuschkin returned; he had passed high and very difficult hummocks, and had crossed wide fissures, notwithstanding which, he had been enabled, by the lightness of his sledge, to accomplish ten wersts in a due-north direction, when all further advance was stopped by the complete breaking up of the ice, and a close approach to the open sea. He

had seen the icy sea break its fetters; enormous fields of ice, raised by the waves into an almost vertical position, driven against each other with a dreadful crash, pressed downwards by the force of the foaming billows, and reappearing again on the surface covered with the torn-up green mud, which every where here forms the bottom of the sea, and which we had so often found on the highest hummocks. On his return, M. von Matiuschkin found great part of the track he had followed already gone, and large spaces which he had just traversed were now covered with water.

All idea of advancing further was now at an end, and it was necessary to hasten back to our last deposit of provisions, that we might secure them before they were reached by the breaking up of the ice. Having replaced them in the sledges, we were so fortunate as to find a somewhat less difficult route, by which we accomplished sixteen wersts in a W.N.W. direction. We saw numerous traces of bears going northwards, probably to seek for seals among the new openings in the ice. On the 11th of April we had a moderate fall of snow: the observed latitude of our halting-place was 71° 54′, and its longitude by reckoning 2° 52′ E. of the greater Baranov Rock.

Our W.N.W. course soon brought us again amongst old hummocks: to avoid them as much as possible, we proposed to turn to the N.E., but first ascended one of them, fifteen fathoms in height, to obtain a view of the state of the ice in that quarter. As far as the eye could reach, we saw new and impassable hummocks; and a sound resembling the rolling of distant thunder, and numerous columns of dark-blue vapour, ascending at various points from N.E. to N.W., were clear

indications of the precarious state of the ice. We had here the opportunity of observing, that when the ice cracks, even in places where it is otherwise thick and solid, vaporisation immediately ensues, which is more or less dense to the view, according to the temperature of the atmosphere, and usually shows itself in the form of vertically ascending columns of dark vapour. As we could not advance to the N.E. we held our course a little further to the W., and halted twenty-four wersts from our last night's resting-place. The warmth of the day had melted the train-oil, so that we had lost the greater part of it. There was so little wood left, that we could only allow ourselves tea and cooking once a-day, and had to be contented at other times with frozen fish, and with snow to quench our thirst.

On the 12th, I sent M. von Matiuschkin to examine whether it would not be possible for us to penetrate through the old hummocks to the north: at the end of three hours he brought back word that it would be very difficult, but not altogether impossible. We made the attempt, and had advanced six wersts, when we came to very thin ice, which had broken in many places, and was covered with a quantity of salt water; these unequivocal indications of an approaching general break-up, warned us to proceed no further, particularly as the north wind continued to increase. The depth of the sea was here fourteen fathoms and a-half, and the bottom no longer green mud as before, but gravel.

We were now in 72° 2′ latitude, and 262 wersts in a straight line from the nearest land, i. e. the greater Baranov Rock. Throughout the whole extent which we had traversed in so many different

directions, the nature of the ice, and the increasing depth of the sea, had indicated that we had increased our distance from the continent; and we might presume with great probability, that if any considerable land existed to the north of us, we had at the utmost only travelled over half the interval which separates it from Siberia. It was not from this consideration, however, or from any cause but actual physical impossibility, that we now at last relinquished the attempt to proceed northwards, and sought instead to reach the meridian of Cape Chelagskoi, due north of which the problematical land was supposed to be situated, according to my instructions. We therefore retraced our steps, and slept at the spot where we had halted on the 10th of April.

On the 13th we reached the deposit of provisions which we had formed on the 6th. We saw numerous traces of bears, which had probably been attracted by the smell, but all their attempts to break the covering of ice had failed. On opening our crypt with crow-bars, we found the hollow filled with water, which had come up through a recent crack in the bottom; fortunately the crevice was a small one, and though the fish was wet through, none of it had been lost. We halted the next day, both to dry the fish as well as we could in the air, and to rest our exhausted dogs.

We resumed our journey on the 15th, with a light breeze from the N. N. E., the thermometer showing —1°. We travelled thirty-six wersts in an E. S. E. direction, along a kind of path, between two rows of large hummocks; at last the masses of ice (which were in many places covered with earth,) approached closer together, and the narrow ravines between were filled with such deep

snow, that both men and dogs were buried in it, and after extricating ourselves, we were obliged to retrace our steps for a short distance. We felt the cold very much during the night; the temperature was —13°, and we had no fire.

On the 16th, we continued our course to the eastward, with clear and calm weather. A good noon observation gave our latitude 71° 30′, and our longitude by reckoning 3° 54′ east of the greater Baranov Rock. In spite of deep snow, and other difficulties, we accomplished thirty wersts.

Although, on the morning of the 17th, the temperature was not lower than —9°, a violent cutting S.W. wind and snow-drift obliged us to halt during the day. At noon we availed ourselves of a favourable moment, when the sun appeared between the clouds, to obtain an observation, which gave our latitude 71° 18′; the longitude by reckoning was 4° 4′ E. of the greater Baranov Rock. Variation 18° E.

On the 18th, the storm subsided, and we continued our route across old hummocks covered in many places with green mud. When we had gone eighteen wersts we encountered two bears, which we chased with no advantage, and with much damage and loss of time. We killed one of them it is true, but he was so thin, and his flesh so hard, that it was useless: several of our dogs were wounded; we lost great part of the day, and encamped for the night much wearied by the hunt. During the night we saw signs of returning spring, in a large flight of black ducks (Anas nigra) proceeding to the N.W.; the floating ice to the north of Siberia, is often covered with these birds.

On the 19th, our observed latitude was 71° 18′ and our longitude by reckoning 4° 36′ E. of the greater Baranov Rock. A violent storm from the N.W., accompanied by a heavy snow-drift, obliged us to halt at noon for the rest of the day. Next morning, although the wind and snow had not ceased, we continued our journey, and three wersts from our halting-place found a tolerably smooth path, bounded to the north by hummocks running in a S.S.E. direction.

We sounded in a cleft which was only covered by a thin crust of ice, and found twenty-one fathoms, green mud, with a rather strong current running E.S.E. In the north-eastern horizon there were columns of dark-blue vapour, similar to those which we had noticed several times before when the ice was breaking. We had this day travelled thirty-nine wersts, and halted for the night under the shelter of a large ridge formed by the junction of old and recent hummocks: the latter extended eastward as far as the horizon.

Early in the morning of the 21st of April, MM. von Matiuschkin and Kosmin went forward in a light sledge, to seek for the best route towards the east, but after going over rugged hummocks with great effort for a single werst to the N.N.E., they came to a space of open water, at least two wersts across; this opening extended from E.S.E. to W.N.W. beyond the visible horizon; the ice on the other side of it appeared to be intersected by numerous fissures, and from the summit of a hummock they clearly saw extensive open water, with fields of thin ice drifting to the E.S.E. About a fathom beneath the surface they found a strong current setting to the S.E.; the depth of the sea was 19¼ fathoms: bottom green mud.

As the open water made it out of the question to attempt to proceed in that direction, we made towards the meridian of Cape Chelagskoi in a S.S.E. direction, where the old hummocks offered rather fewer difficulties than the recent ones: we travelled the whole night, but the deep snow prevented us from accomplishing more than twenty-seven wersts.

On the morning of the 22nd, we were surrounded by a thick fog, which concealed even the nearest objects. When it cleared, we saw plainly to the south the black bluff rocks of Cape Chelagskoi appearing above the horizon. The south-eastern point of the coast bore S. 45° E., the middle summit S. 40° E., the south-western point of the promontory, distant fifty miles or eighty-seven wersts, bore S. 33° E.

At 3½ P.M. we found the variation 18° 49′ E. The noon observation gave the latitude 70° 53′, and our longitude derived from the bearings of the land, 6° 40′ east of the greater Baranov Rock. Our reckoning was in error 24′, corresponding to an actual distance of eight miles. An observation of the dip, in which the poles of the needle were not reversed, gave 79° 57′ N.

The constantly-increasing depth of the sea, and the number of spaces of open water, so little corresponded with the vicinity of the continent, that if we had not been assured of its existence by the evidence of our senses, we could hardly have imagined that we were within ninety wersts of the main land. This remark leads to the inference that our hitherto fruitless endeavours to find the supposed Polar land *may* prove nothing against its existence: strictly speaking, they only prove that notwithstanding all our efforts it was impossible for *us* to reach it; whether the insur-

mountable obstacles which stopped us, would always present themselves, I do not venture to decide. Two circumstances should be noticed:—first, although in this vicinity we met with many recent fractures, the ice itself was every where thick, and covered with solid snow: whereas, further north, the ice was very thin, and had very little snow on its surface:—and, second, north winds are always damp winds: both these circumstances indicate that the general state of the sea to the north differs materially from its condition in the vicinity of the continent.

Towards evening a fresh S.S.W. wind covered the sky with clouds: the state of the ice induced us to take a S. S. E. course; we found a piece of half-decayed fire-wood, which was a very acceptable addition to our scanty stock of fuel. After travelling nineteen wersts, our further progress in a S. S. E. direction was stopped by a mass of impassable hummocks, which extended to Cape Chelagskoi. The rocks of the Cape were clearly distinguishable; their outer point bore S. 30° E. Although the horizon was remarkably clear, we could not discover any indications of land, either to the east or to the north. Assuming that any land, which was not extremely low, must have been visible at a distance of fifty wersts, and that we were eighty wersts distance from Cape Chelagskoi, it is manifest that in the meridian of that cape no land exists for a distance of 130 wersts to the northward of the Cape. We have already seen that there is no land for 300 wersts to the north of the greater Baranov Rock.

Having only food for four days for our dogs, and being 200 wersts from our deposit of provisions, the season also being very far advanced,

we determined to return without delay, and on the 23rd of April travelled twenty-six wersts in a westerly direction, over hummocks of old ice, and through loose snow. The noon observation gave the latitude 70° 50′, our longitude, by reckoning, was 2° 8′ W. of Cape Chelagskoi.

In the afternoon we saw, to the south, a continuous low coast, apparently raised above the true horizon. We were opposite to Sand Cape, but as the interval which separated us from the coast was not less than ninety-eight wersts, this effect must have been produced by the strong refraction of these regions, which has often led to the discovery of remote objects. On the 24th we travelled thirty-five wersts, meeting with frequent tracks of bears and stone-foxes.

On the 25th the noon observation gave 70° 54′ latitude, our longitude, by reckoning, was 3° 12′ W. of Cape Chelagskoi; hummocks and loose snow prevented us from accomplishing more than thirty-eight wersts. Large flights of black ducks passed over us to the westward.

On the 26th, though the ice was still difficult, we made forty-three wersts; a piece of fresh aspen-wood was picked up near our halting-place. Our provisions were now quite consumed, and the drivers were very uneasy about the dogs, which lose their strength very quickly when food fails. But in reliance on our reckoning, by which we could not be more than one day's journey from our deposit, we pushed on cheerfully on the 27th, over a less-difficult route than heretofore, and arrived at the spot in the evening, after a march of forty-wersts. Ten wersts before reaching it, we found the old track of M. von Matiuschkin's sledge. The 29th was a day of rest for our dogs,

and of refreshment for ourselves, enhanced by finding a large piece of drift pine-wood, which enabled us to make a good fire. The marks of teeth and claws about the block of ice, and the torn-up snow, showed, that during our twenty-eight days' absence, the bears had made numerous and vigorous attempts on our store-house, but happily without success; we found every thing uninjured. As the advanced season, the low state of our provisions, and the dilapidated condition of our sledges, forbade any continuation of our journey, I thought it best to return to Kolymsk by the track we had already travelled; it had been so much improved, by the consolidation of the loose snow, which had since taken place, that we accomplished fifty-five wersts on the 29th, fifty wersts on the 30th, and reached the coast on the evening of the 1st of May, where we halted for the night, half-way between the greater and the lesser Baranov Rocks.

Weary as we were, we rose very early the next morning, to enjoy the long unseen aspect of the brown earth. The grey moss, the low leafless bushes, and the notes of the few birds, all told of land, of spring, and of a return to animated nature: and we wished each other joy of our recent toils and privations being over for the present.

It is with the warmest pleasure that I here record my grateful thanks to my two excellent companions MM. von Matiuschkin and Kosmin, for their zealous support throughout the difficulties of the journey we had just completed; in which all hands had frequently to join in dragging the sledges through nearly bottomless snow, and over perpendicular cliffs of ice; and I cannot but

believe that it was in great measure owing to their example that our sledge drivers encountered so many toils, privations, and dangers, cheerfully and without a murmur.

On the 4th of May we arrived at Pochodsk, where a new and joyful surprise awaited me. My friend and brother officer Lieutenant Anjou had just arrived from the island of New Siberia with the expedition under his command, proposing to visit Nijnei Kolymsk, and return along the coast to the Iana. Our happiness, in meeting thus unexpectedly in these remote regions, could not but be alloyed by the sight of the suffering and misery which surrounded us. Six half-starved Tunguse families, urged by despair, had exerted the last remnant of their failing strength to reach this place, where they found the few inhabitants in a scarcely less sad condition, their stores being quite consumed, and they themselves supporting life as well as they could on the remnants of bone and skins, until the approaching spring should bring the anxiously-looked-for relief. We divided amongst them all the remainder of our provisions, and had reason to hope that this assistance saved the lives of several.

On the 5th of May we reached Nijnei Kolymsk, after an absence of fifty-seven days, in which time we had travelled 1355 wersts. I found here new orders from the Governor-general of Siberia, in reference to our employments for this year. Our worthy companion Dr. Kyber was only partially recovered, and was suffering with his usual patience and cheerfulness. The town was empty, all the inhabitants being absent on their summer employments, except the invalid Cossack who always remains on guard, and our old housekeeper.

On the 10th of May the first rain fell, but summer had not yet arrived, and we had snow repeatedly afterwards. About the 17th, fresh grass began to appear on the sheltered banks; and on the 22nd, the ice which had covered the river for 259 days broke up. On the 26th of May the usual inundation followed, forcing us to take refuge with all our goods on the flat roofs of the houses, there to await the termination of the flood. To provide against cases which sometimes occur, of the buildings being materially injured by drifting masses of ice, or of the inundation reaching the roof, we had boats at hand, to enable us to retire, if needful, to the Panteljiva mountain. The inhabitants always take care before leaving the place to remove all their portable goods to the roofs of their houses, which certainly present a singular aspect, being covered with sledges, chests, casks, and household utensils of all kinds. On the 31st of May, the water began to subside, and we were soon afterwards able to return to our dwellings; but in spite of the constant fires which we kept up, it was long before we got rid of the cold damp atmosphere proceeding from the walls, which had been thoroughly saturated with moisture.

CHAPTER XII.

M. VON WRANGELL'S JOURNEY THROUGH THE STONY TUNDRA IN THE SUMMER OF 1822.

I HAD designed to employ this summer, partly in preparations for our next winter-journey, for which the balagan built near the great Baranika was to serve as head-quarters, and partly in surveying the coast from the mouth of the Kolyma to the greater Baranov Rock, and in repeating the astronomical determinations of the principal points on the coast, which I had made in the winter of 1821.

As soon as the spring floods subsided, I despatched four trustworthy persons to the village of Panteljiva, from whence they were to proceed on horseback to the balagan, to build a karbass there, and to take as many fish as possible with nets and baskets, to form the staple of our provision for the next winter's journey. They were also to kill as many swans and geese as they could.

On the 23rd of June, Lieutenant Anjou, M. von Matiuschkin, M. Kosmin, and myself, descended the river in our own boat, the Kolyma, and visited in passing, the settlements of Krestowoi, Tschernoussow, and Pochodsk, where fisheries for the use of the expedition were in progress. At Pochodsk, Lieut. Anjou quitted us to proceed on horseback to the Indigirka, with three companions.

On the 26th we reached the rocky point on the right bank of the Kolyma, called Krest, (the Cross,) where two Russian families had settled for fishing. The little river of Panteljiva falls into the Kolyma fifteen wersts from this point.

The situation of Krest possesses such great and important advantages over that of Nijnei Kolymsk, that it would be very desirable to remove the little town to it, for the sake both of the inhabitants of the place itself, and of those of the district generally. The high bank, which is quite large enough to admit of the buildings standing at suitable distances from each other, is above the level ever reached by the spring-floods. There is abundance of drift-wood of the best kind for building; and both on the bank, and on several islands in the river, there are good pastures, which might even supply winter-hay for the horses. Vegetation generally has far more vigour and variety than at Nijnei Kolymsk; the larch-tree attains greater height and size, and many herbs and berries are to be found. Krest is also tolerably central in respect to the various villages and settlements, whose inhabitants have to resort to the town at different seasons of the year, and to whom, therefore, the change would be highly advantageous. As the distance is twenty-five wersts down the river, it would not be difficult nor expensive to remove whatever was worth the carriage; lastly, the situation and neighbourhood are far more agreeable and healthful than those of Nijnei Kolymsk, and sheltering hills and woods render it far less cold. In short, the removal would be such a benefit, as would repay a hundred-fold the little cost and labour which it would require.

The steep bank of the river which makes a bend at Krest in a N. 40° E. direction, consists of indurated clay, of a dark-red and of a green colour. Contrary winds obliged us to remain here a day, so that we could not continue our voyage until the 28th of July. Rocks, similar to those at Krest, follow the direction of the river for fifteen wersts, forming a bluff steep bank; they then retire inland, and join the west side of the mountain of Surowaia, which is washed by the Panteljiva. This river is twelve fathoms broad at its mouth; we turned into it, and our boat, which was drawn by twelve dogs, ascended the stream rapidly; the banks are covered with a layer of vegetable earth, in which sand-willows and alder-bushes grow.

The weather was warm, and the clouds of mosquitoes tormented us so much, that we were glad to take refuge in an out-house filled with smoke, on arriving at the village of Panteljiva, which is situated on the left bank of the river, amidst good pastures, and among lakes abounding in fish. On the right bank, at about eight wersts distance, rises the Panteljiva mountain with its two summits.

We met here our former travelling companion, the active merchant, Bereshnoi, who helped us out of a great perplexity. I had not been able to obtain the number of horses which we required, and the short summer might easily have been lost in fruitless endeavours to procure them, if M. Bereshnoi had not most kindly offered us the use of ten of his; at the same time entirely refusing any payment. "You travel by the Emperor's order, and for the general good," said he, "and why should I take any money from you? God has blessed my industry, and I do not want it."

He was preparing for a journey to Tchaun Bay, in search of mammoth-bones, and as it was part of our plan that M. von Matiuschkin should explore that country, he offered to join M. Bereshnoi, which was a very agreeable and useful arrangement for both parties.

Every thing being settled for our different journeys, we availed ourselves of the mild weather to make an excursion to the Panteljiva mountain, and followed a very narrow pathway leading to the summit. This mountain affords a shelter from north winds, and favours vegetation in a high degree; it is a place of great resort for gathering the Vaccinium uliginosum (the whortleberry), which is very abundant and fine here. Unfortunately, the thick larch-woods, which once covered the hill and part of the plain at its foot, were destroyed fifty years ago by a forest-fire, which spread from the banks of the Aniui to the extreme northern limit of the woody region. A young growth of larch has sprung up within the last two or three years; its lively green is most pleasing to the eye, and many flowers grow amongst the young trees. Higher up, thyme and other herbs are met with, and still nearer the summit the dwarf cedar creeps over the stony ground; the summit itself has no vegetation, save grey moss and a few lichens. The view is extensive, and at this season pleasing. From N. W. to S. the eye loses itself in the vast tundra interspersed with lakes of various sizes, forming the left bank of the Kolyma, and adjoining the mouths of the two Aniui Rivers. One can follow the course of the Kolyma, and its numerous islands, for 130 wersts, from above Nijnei Kolymsk to the sea. To the north the view is

bounded by the neighbouring low hills, behind which rise others covered with perpetual snow; and still further off the black and pointed summits of the rocks near the sea are visible. Towards the east, are seen the White Rocks, which form a rather long chain, running in an E. S. E. direction; it is only the nearest end of the chain which is visible from the Panteljiva. In the distance, in the S. and S. E., are the plains and mountains adjoining the rivers Aniui and Tunkina. The tract of country descried extends about 300 wersts, in almost every direction.

The highest summit of the Panteljiva is covered with fragments of black slate, among which there are traces of weathered whitish granite; the rock, of which the mountain itself is composed, is nowhere visible.

The southern declivity forms an angle of 30° with the horizon; the north side is steeper, but there are no ravines of any importance. There is a second lower summit to the west of the principal one. From Nijnei Kolymsk, the angle subtended by the highest point, is 0° 48′ 45″, the distance being 14,758 fathoms, which gives 1,491 feet for the vertical height above the Ostrog. In calm, clear weather, at 5 P.M. the temperature at the top of the hill was + 35°, and at its foot + 43°. After taking the necessary angles from the summit, we returned to the village, the latitude of which, by the angles, and by a meridian latitude, taken on the 28th of June, is 68° 57′, and its longitude, 0° 40′ E. from Nijnei Kolymsk; the variation is 12½° E.

Immediately after sunset, the thermometer sunk below the freezing point, dark clouds gathered

round the mountain, and a storm came on from the west. In the morning, the upper half of the hill was covered with thick snow, and torrents of rain fell in the low grounds. This bad weather detained us till the first of July, when we resumed our journey with a clear atmosphere. MM. von Matiuschkin and Bereshnoi went first to Ostrownoie to procure an interpreter for communicating with the Tchuktches. They were to travel from thence to Tchaun Bay. I proceeded to the sea-coast, for the purpose of repeating, in obedience to my instructions, Captain Billings' determination of the position of the Baranov Rocks. I was accompanied by M. Kosmin, a sailor, and two Iakuts, with six loaded pack-horses.

We slept the first night on the north side of the Panteljiva mountain, near a small lake; the contrast between this tract, which is exposed to the north winds, and the sheltered and smiling district which we had just quitted, was very great; at every step the larches became fewer and more stunted, and soon ceased entirely, being replaced by small sand-willows, and dwarf-birch, less than a foot high. More generally the ground is bare, or at most, covered with grey moss, and a little thin grass, turned yellow by frost; a few blackened stems of burnt larch still remain. The ground in these valleys is generally clay, but the small lake, near which we halted, is clear, with a gravelly bottom. The air was mild; the sky clear, and the temperature at midnight + 43°. The summits of the Panteljiva Mountain, and of the White Rocks, were reflected in the glassy surface of the lake; I availed myself of this natural mirror to take their angular height, as neither time nor circumstances

admitted of my measuring the elevation of these hills in any other manner. From this measurement I obtained the heights as follows:

The central point of the White Rocks,	2509 feet.
The eastern summit of the Panteljiva,	1740 feet.
The western summit of the same	1167 feet.

Much snow still lay on the sloping-sides of the White Rocks, (so named on that account,) but their summits were bare; chiefly, no doubt, from the influence of the wind. This frequently happens at all seasons of the year, and renders it difficult to determine the height of the snow-line. On the tundras, though exposed to the full beams of the sun, the earth never thaws to a greater depth than from seven to ten and a-half inches; masses of ice remain on the sea-beach unmelted throughout the summer, and the snow often lies in the valleys from year to year; probably the whole surface of the sea would be perpetually frozen, if the ice were not broken up by tides and currents, and by the violent storms which always prevail in spring.

On the 2nd of July I determined the latitude by a meridian altitude, 68° 42′, the longitude being 160° 51′, variation 12½° E. The temperature was + 50°. After a march of twenty wersts, we slept on the banks of the Philippowka: the intervening tract is marshy and barren, but near the river we again met with larch-trees and pastures, and found whortleberries, and the Knäsheniza *(Rubus arcticus,)* which grows here abundantly. This plant resembles the strawberry, and the fruit is something like a raspberry in appearance, but its fine aromatic scent and flavour are such as one would not expect to meet with in such a climate.

The Philippowka is a rapid stream which rises in the White Rocks, and empties itself into the Kolyma. The Salmo thymallus is both large and abundant in its waters. Its valley used to be famous for numerous elks, until the great forest fires of 1770 drove them away. They gradually returned as the trees began to grow again, and in the winter of 1812, almost every hunter killed as many as six. Perhaps too many were thus destroyed, as they have been extremely rare ever since; even a single elk being seen in the Kolymsk district is now quite an event. Their disappearance is a severe loss to the inhabitants.

On the 3rd of July we had a warm south wind, the temperature was + 50° in the morning, and + 56° at noon; both ourselves and our horses suffered in consequence so much from the stings of the mosquitoes, that we wished for cold weather again. The meridian altitude gave the latitude 68° 53′, the longitude by reckoning was 162° 9′, the variation was 13° E. We followed the lower arm of the Philippowka for sixteen wersts, and for the sake of the pasture, halted early in the valley, as we could not expect to find much grass on the next day, when we were to cross the ridge which joins the Sucharnoi Hills to the Larionow Rocks, on the right bank of the Kolyma. The woody region terminates here in latitude 69° 5′, beyond which there are only very few small and stunted shrubs. This is the limit of the stony or rocky tundra. It was now so cold that we were forced to wear our furs again. At sunset the thermometer showed + 30°.

On the 4th of July we crossed the ridge by a broad track made by the rein-deer. At the highest point I took a meridian altitude, which

gave the latitude 69° 5′, the longitude being 162° 9′, and the variation 15° E. In clear weather the mouths of the Kolyma may be distinctly seen from this point, but they were now concealed by a mist, which only allowed me to take two angles. The north side of this ridge is steeper than the south. We descended into a deep narrow valley, running S. 56° W.; the surface rock is nowhere visible, but we saw numerous fragments of white granite and black slate. From the north side of the ridge we saw to the right the Sucharnoi Mountains, covered with perpetual snow, which run N.N.E., and form the centre of this group of hills. In the valleys through which we passed, we often met with snow so firm as to support the horses. At night we had a N.E. breeze, with a temperature of + 26°.

On the 5th of July our observed latitude was 69° 18′, our longitude 162° 03′, and the variation 15½° E. We crossed two shallow and rapid arms of the Sucharnaia, which unite and fall into the Kolyma, near the balagan of Sucharnoi. We also crossed another small river called "the deep stream," which falls into the Kolyma, near Leptew's tower. Its banks are earthy, and are said to contain many mammoth-bones. After passing a few hills, we came to the Medweshia or Bear River, which is ten fathoms across, and so deep, that it can only be forded at a few spots. We killed, on some neighbouring lakes, a number of wild-geese, which had come here for moulting; they were very acceptable, as was a kind of onion which we found growing in dry sandy places. We slept at the foot of the hills which joined the Baranov Rocks. Snow fell at night, and the temperature was + 25°, next morning it rose to + 43° with fine weather.

Our way lay across the Strand Hills, which run parallel with the coast; they consist chiefly of earth and ice, and are not connected with each other, but divided by deep ravines. We had an extensive sea-view from one of these hills, and saw large drifting hummocks to the north, but a solid sheet of ice adhering to the coast of the continent.

We reached the shore near the little Baranov Rock, where Captain Billings' expedition landed, and where we found the cross erected by him, and inscribed "1787, 12th July;" it was still in good preservation. I pitched here our little camp for the purpose of repeating the observations which that navigator had made fifty-five years before. The weather on the 7th of July was very favourable. The sky was clear, and the temperature +43° at noon.

We had two sextants, one of Troughton's and the other of Carey's; with these, M. Kosmin and I obtained the double altitude of the sun's lower limb, as follows:—

Troughton's sextant .	82°	16′	03″
Carey's	82	17	02
The mean is	82	16	32

Whence the latitude 69° 38′ N., and the longitude, deduced in our former survey, is 162° 49′ E. The variation was 12½° E., which surprised me, as the easterly variation ought rather to have increased since our last observation, which was further to the south.

In order to repeat the rest of Captain Billing's observations, on the spot where they were made by him, we followed a steep, rocky, and difficult

path, running along the edge of the sea, to the mouth of a small river, which empties itself into a little bay on the west side of the most projecting point of the lesser Baranov Rock. This is the spot where Captain Billings observed on the 29th of June. The rocks on the west side of this Cape, consist of common quartz, with large drusy cavities, in which we found very regular crystals about an inch long. Further to the east, the surface is covered with fragments of a fine-grained whitish granite, strata of which crop out in an irregular manner towards the sea; on the summit there are several pillars of a similar granite.

On the 8th of July we had clear weather, and a noon temperature of + 48°; we found the meridian double altitude of the sun's lower limb, by

Troughton's sextant .	81°	46′	53″
Carey's sextant . . .	81	48	00
The mean	81	47	26

Whence the latitude 69° 41′ 48″ N.; longitude 163° 19′ E. Variation 13° E.

From this point we proceeded to the spot where Captain Billings observed the latitude on the 6th of July, which we identified as well as we could by means of the Admiralty map. After crossing the ridge, which runs inland from the Baranov Rocks, we saw on the eastern side hollows, where the rock, being covered with vegetable earth, formed grassy valleys, in which large flocks of wild sheep were feeding. They climb these almost perpendicular cliffs with wonderful agility, and are nowhere so numerous as at these rocks,

which are called from them Baranov Rocks,—Baran signifying Sheep.

The mountain is covered, from the foot to the summit, with immense fragments of rock; they are of the same white granite as the upper pillars, which are fifty or sixty feet high, and have the form of a four-sided parallelopipedon, of which the northern and southern faces are the broadest. To the east of the granite rocks, slate reappears, and forms the extreme point of the rocks, thirty feet high.

The general form of these rocks is an elongation from W.N.W. to E.S.E.; the eastern and western sides are steep; the ravines through which the streams flow to the sea, have all a W.N.W. direction. From the summit of the hill we had an extensive view over the sea, and over the wide bay between the two Baranov Rocks. The bay was covered with fixed ice, as was also the sea in a N.N.E. direction, as far as the eye could reach. In the evening the air was perfectly calm, the sky clear, and the temperature + 43° at midnight.

On the 9th of July the meridian double altitude of the sun's centre was by Troughton's sextant, 81° 27′ 38″; hence the latitude was 69° 40′ 34″; the longitude was 163° 52′; variation 13½° E. The promontory of the lesser Baranov Rock, behind which is our place of observation of the 8th of July, bore S. 89° 30′ W. distant seven geographical miles.

I cannot be quite sure whether our observations were made exactly at the same spot as those of Captain Billings on the 6th of July 1787, as the shore is here very sloping, and there is no striking

feature; we were guided by the distance from the lesser Baranov Rock.

The want of provisions obliged us to go somewhat inland, in order to kill some of the numerous wild geese which breed on the small lakes. We soon shot seventeen, which our guides accounted a good number, according to the present standard. Formerly many more geese were killed here than is the case at present. For some few years past they seem to have resorted in preference to the shores of the Indigirka, where many thousands are killed every summer, They are sometimes driven in flocks into a large empty hut, or knocked down with sticks in the open plain. A good deal of experience and skill are necessary on the part of the fowler, as though the moulting birds cannot fly, they run extremely fast. When in danger, they cower on the ground, stretch out their necks, and hide their heads like the ostrich between the little moss hillocks. They lie in this way so motionless, that an inexperienced person passes them by, supposing them to be already killed. They usually form large flocks, each of which has a leader, whom they never quit except in great danger. The natives distinguish four kinds of geese: the white goose which used to frequent the sea shore in great numbers, but seems to have disappeared; the proper wild grey-goose (gumennik) which is the largest kind; and the kosarka and piskun, which are much smaller. The piskun is not larger than a tame duck.

Many of the lakes in this neighbourhood are surrounded by earth-hills containing mammoth-bones. These hills, and the lakes which are between them, are bounded on the south by a range which rises to the E.S.E. of the lesser

Baranov Rock; the latter looks from a distance like a detached island. Our pursuit of the geese conducted us to the sea-coast fifteen wersts east of the greater Baranov Rock, where we slept on the 9th of July. On the next day the air was calm, and the temperature 48°. The noon observation gave the latitude of our halting-place 69° 36′, its longitude by reckoning was 164° 32′: the north point of the greater Baranov Rock bore N. 50° W. The variation was 13½° E.

As Captain Billing's fourth and last observation on this coast was made at the most northern point of the greater Baranov Rock, I went thither, leaving two of my companions to continue fowling. A large flock of geese covered the small river Semlänaia, which flows into the sea at the foot of rock, but as we approached, they filled the air with their loud cries, swam across the open water at the mouth of the river, and gained the sea-ice, over which they ran away with incredible swiftness. I have since had occasion to remark that rein-deer escape from their pursuers on the ice in the same manner. As we ascended the south side of the greater Baranov, we saw a numerous herd of wild rein-deer feeding on the young grass in the plain below, but they were alarmed by the barking of our dogs, and fled so quickly that we could not kill even a single one. We found the plain where they had been feeding strewed with their hair; our guides said they always sought the coast when they were changing their coat, as there are much fewer mosquitos near the sea than inland.

Hitherto we had pursued a route along the flat coast, but now it became necessary to make our way across the rugged and broken ground of the

greater Baranov. The observation of Captain Billings, of the 21st of July, 1787, which I was directed to repeat, was made on board ship, three miles north of this promontory. The spot which I selected as most probably coinciding *in longitude* with the position of Captain Billing's ship, is the N. E. point of the promontory; we arrived at this spot the evening of the 10th, which was the finest of the whole summer, perfectly calm and clear, with a temperature of + 55°. On the 11th of July we had a fresh breeze from the west, with the thermometer at + 43°; our noon observation gave by the mean of the double altitudes of the sun, with the two sextants, the latitude of 69° 43′ 56″, the longitude being 164° 10′ E. and the variation 12° 35′ E. In the afternoon a mist, with occasional showers of rain, came on, and the weather continued the same until the 19th; it was therefore very fortunate that we had completed our observations.

The following is the comparison of the latitudes we had observed, with those of Captain Billings:

	1787.		1822.		Diff.
	° ′ ″		° ′ ″		′ ″
North Point of the Lesser Baranov	June 29. 69 27 26		July 8. 69 41 48		14 22
Between the Greater and the Lesser Baranov	July 6. 69 27 43		July 9. 69 40 34		12 51
West Side of the Lesser Baranov	July 12. 69 22 48	July 7. 69 38 0			15 14
	July 13. 69 22 44				
North-east Point of the Greater Baranov	July 21. 69 35 56		July 11. 69 43 56		8 0
Ostrog of Nijnei Kolymsk ..	68 17 14		68 31 51		14 37

Captain Billing's observation of the 21st of

July, was made three miles north of the shore, consequently the difference of 8′ 00″, on that occasion, should be increased to 11′ 00″; some doubt may exist whether his observation of the 6th July, and ours of the 9th July, were precisely at the same spot; the places of observation on the three other occasions were identical, and give a systematic difference of about 15′.

The variation, generally, from Nijnei Kolymsk to the Baranov Rocks, has decreased in the thirty-five years, about 5°, as is shown by the following observations:

	1787. ° ′	1822. ° ′	Diff. ° ′
Nijnei Kolymsk	13 04	9 56	5 08
Between the Lesser and the Greater Baranov.	17 12	12 30	4 42
At the Greater Baranov	17 40	12 35	5 05

After completing these observations, we returned to the mouth of the Semlänaia, which we found very much swollen by the entrance of sea-water. Along the whole of this coast, west and north-west winds cause the sea to flow into the rivers, and to raise their level, which sinks again with southerly winds. We were never able to perceive any regular ebb and flood, nor had the inhabitants ever remarked any. This part of the coast generally is characterized by dark rugged rocks, from which nothing can be seen on the landward side save the desert tundra; whilst to the north, the Icy Sea offers a still more dreary view. Death-like stillness reigns; no traces of men are visible; and but few of animal life, save for a short portion of the summer, during which the rein-deer resort here to avoid the mosquitoes, and the wild-fowl seek the mouths of the various small rivers, where they find most food, and

where they moult, and bring out their young broods, at a distance from human habitations. We resumed our march on the 12th, but halted for that night and the following day near a river, where we found good pasture for our horses. The weather was raw and unpleasant. A north-west wind brought with it a thick fog; the temperature at noon was only, + 34°, and at night the small lakes became covered with a thin crust of ice. We found near our halting place, several mammoth-bones and pieces of whale-bone, but they were not in very good preservation.*

On the afternoon of the 14th of July, as we were crossing a river, M. Kosmin's horse started, and threw him; he gained the bank by swimming, and immediately changed his clothes; but as the evening was cold, and as we had first a fog and then heavy rain, I thought it more advisable, instead of halting for the night, to continue our ride, by which the blood would be kept in circulation, and bad effects from the chill prevented; this precaution was quite successful.

After a march of eighteen hours, we reached the balagan, which had been built in the preceding summer, near the mouth of the great Baranika. It consisted of one large room with a fire-place, and a store-room for provisions. The river is a werst across at the mouth, but so shallow, that when the water is low, banks of mud are left dry in the middle of the river. The right bank is steep and rocky: the left, near which our

* The best mammoth-bones, as well as the greatest number, are found at a certain depth below the surface, usually in clay hills, more rarely in black earth. The more solid the clay, the better the bones are preserved. Experience has also shown that more are found in elevations situated near higher hills than along the low coast or on the flat tundra.

balagan was built, is flat and sandy. The horizon from S. E. to S. W. is bounded by a range of snow-covered mountains, where this river rises, as well as another which empties itself into the sea thirty-five wersts to the westward. Both rivers are called Baranika, by the people of the country, from the nnmerous wild sheep which are found near their sources, and which are great objects of chase in winter. Our balagan was surrounded by small lakes, where large flocks of wild geese are always assembled by the 10th of July. About the 1st of August, swans usually arrive for their moulting season, at a part of the coast thirty wersts to the eastward.

There are many traces of a former Tchuktche settlement about one werst below our own buildings, such as large heaps of bones, marks of fire, and household utensils, among which was a lamp formed of basalt, and extremely well executed.

I had the satisfaction of finding the people whom I had sent here from Nijnei Kolymsk safe and well, and busily engaged in building a boat, and making nets and other preparations for fishing. They talked much of roving parties of Tchuktches, who they suspected had been in the vicinity in the night, but this idea appeared to us groundless, and to have been suggested only by their fears. On our last day's march the Iakuts and the pack-horses had been left behind, with all our baggage, including instruments; as the day passed without seeing any thing of them, we became uneasy, lest something had befallen them. They arrived late at night, having been delayed by meeting a large black bear, which frightened the horses so much that they broke loose, and could not be caught for some time: the baggage

had fallen into the water, by which many things were spoilt, and one of our thermometers was broken, so that we had only one left. During our stay we employed ourselves partly in setting forward the fishery, the success of which was essential for our next year's expedition, and partly in exploring the country. When the weather was unfavourable for fishing, we rambled over the tundra on horseback, visited the coast and the different lakes, shot wild geese, and once killed a large black bear, and acquainted ourselves, as much as possible, with the best places for the rein-deer hunt. One day we visited the river Kosmina, twenty wersts east of the Baranika, in our new boat. The middle of the river was navigable, but a great deal of ice still adhered to the banks. Whilst we were there the ice detached itself, and completely blocked up the stream, detaining us for three days, during which we were constantly exposed to heavy rain, without any shelter. At last a south wind cleared the river of ice, and allowed us to return home. The Kosmina is not so broad as the Baranika, but it is much deeper, and abounds much more in fish, especially salmon trout, and another kind of red fish, called by our companions Krasnina, which we found very well tasted, but unwholesome, causing sickness and a feeling of langour in all the limbs. Among other natural products, pointing to an earlier epoch, were some half frozen, half-mouldering shell fish, similar to those called shrimps in England, and such as I never saw any where else in Siberia, either living or dead.

The flora of this part of the country is limited to mosses, a low hard grass, and a very few flowering plants. The sea-cabbage *(Crambe maritima)*

is occasionally met with, but it is very rare, and I never saw any of it.

During the whole time of our stay clouds and mist were more frequent than fine weather. It often rained, and sometimes snowed heavily. The warmest day was the 24th of July, when the thermometer showed + 55° at noon, and + 53° at midnight.* This day, and particularly the night, reminded us of the sultry summer days and nights in the southern part of Russia. The calm of the atmosphere was unbroken by the slightest wind, and the perfect stillness which prevailed was interrupted only by occasional loud claps of thunder to the east. This weather was followed by a thick mist, which concealed objects a few fathoms distant. I examined the temperature of the sea-water whenever we could go 100 fathoms from shore in the boat, and found that at that distance, and at a depth of a fathom and a half, the temperature of the water varied from + 34° to + 40°, without any sort of agreement with that of the atmosphere. The sea-water was less salt than might have been supposed, owing probably to the number of rivers, and to the quantity of melting ice and snow which came from the coast. As I have before mentioned, neither here nor elsewhere could I perceive any regular ebb and flood. Westerly winds, (particularly from W. N. W.) cause a current along the coast, varying in strength with the force of the wind, bringing the drift ice near the shore, and raising the level of the water three or four feet, until a land wind drives back the water, or a calm allows it to regain its natural level. When the wind is from the N. E. the cur-

* After the 6th of July the thermometer averged + 28°; at noon it was usually + 35°, and seldom rose as high as + 48°.

rent sets to the west; but as the wind seldom blows long, or with much force from that quarter, the easterly current is the prevailing one.

The sea was never free from ice, which remained immovably fixed along the horizon, whilst only small pieces drifted about in the open water close to the shore. On calm days we could distinctly hear the distant sound of the crushing of the ice. When it is remarked in addition, that northerly winds raise very little sea, it will appear a highly probable inference that the part of the ice which we now saw to the north, and in which we buried our provisions last spring, is *permanent;* and this is in accordance with the distinction between the hummocks of old and of recent formation, previously drawn from their appearance and colour.

On the night of the 21st of July, MM. von Matiuschkin and Bereshnoi arrived with the Tchuktche interpreter. They stayed a week with us, and then continued their journey to Tchaun Bay.

On the 31st of July we obtained fifty lunar distances, which gave the longitude of our balagan, 166° 41′ E. The latitude is 69° 31′. Variation 15° 25′ E. After completing these observations I resumed my journey on the 31st of July, with two men on horseback, and a pack-horse carrying our baggage and instruments: my purpose was to ascend the greater Baranika to its source, and to proceed thence to the lesser Aniui and Kolyma. M. Kosmin remained with four persons to direct the fishery: as soon as his presence should be no longer requisite he was to return by the shortest route to Nijnei Kolymsk.

Our first day's march led us over some low hills at a little distance from the river, in order to find a convenient ford across a tributary stream which

falls into it. We met with a great number of holes of stone-foxes, all containing young cubs, which are called Nornik for the first four weeks. Their skins, which are brown with light curly hair, are very soft; and are used in the country for lining and trimming the Parka, or fur under garments. The dog killed a great many, which the Iukahir, our companion, skinned with wonderful quickness. The natives have always remarked that stone-foxes are abundant every three years, and they had assured us for the last two years, that there would be a great number of young foxes this summer. We slept in a dry pasture twenty-two wersts from our balagan, and four wersts from the Baranika. My companions were surprised at this place by the novel sight of two cranes: these birds are extremely rare visitants, and their appearance, when it does occur, excites great attention.

The noon observation on the first of August, gave the latitude 69° 23′, variation 15° E. The temperature was mild and agreeable, but I could not determine its amount during the present journey, as one of our two thermometers had been broken, and I had left the other with M. Kosmin to continue the observations on the temperature of the sea-water.

As we approached the Baranika, the hills and rising grounds gradually diminished both in number and elevation, until we found ourselves on a great plain with numerous lakes of various sizes; we rode on for twenty-six wersts, and halted for the night on the left bank of the river, thirty-eight wersts from its mouth. It is here about twenty fathoms across, rapid but not deep, and frequently crossed by ridges of rock, which afford convenient fords. The right bank was steep and rocky, and

the ground was generally covered with small fragments of black slate and green-stone porphyry, amongst which we found flints, and some good specimens of dark-red jasper and cornelian.

The river, which bears the name of the greater Baranika, is formed by the junction, at this place, of two rivers, the easternmost rising in mountains to the south-east, and the other in mountains to the south of us.

On the 2nd of August, we found ourselves, by the noon observation, in 69° 09′ latitude, and in 11′ of longitude W. of the balagan by reckoning; variation, 15° E. The sky was overcast, but the air was mild and the weather perfectly calm. We crossed some rocky elevations, and near the bank of the western arm of the river came to an insulated hill of weathered granite and black-slate; the strike of the strata of the hill was W.N.W., dipping to the N.N.E. at an angle of 60° with the horizon. At the foot of this hill the Baranika makes a bend to the west, which we crossed the river to avoid, keeping a southerly course; and, after passing some more hills of black-slate and conglomerate, we rejoined the stream, which divides here into two arms. We followed the western one, which is rapid and only five fathoms broad, and halted for the night on its banks, twenty-two wersts from our last sleeping-place. We had much rain and wind from the north, during this night and the following morning. It cleared up at noon, so that I was enabled to obtain an observation which gave our latitude 68° 57′; the longitude was 0° 14′ W. of the balagan by reckoning.

After following the arm of the Baranika for six wersts, we found it divide into three streams, of

which we chose the middle one as our guide. The valley narrowed more and more, and we soon found ourselves shut in among mountains and precipices, often overhanging dark ravines filled with snow. After much toil and difficulty, we reached the summit of the mountain late at night, but found it to consist of a deep morass, affording neither pasture for our horses nor a dry resting-place for ourselves; and we were forced to drive our jaded beasts seven wersts further, along a small stream which rises in this upland morass, and flows southwards to the Poginden. At the last fork of the Baranika the rock consisted of weathered granite. In the ravines on the north side of the hills, I saw black hard slate, and veins of quartz.

On the 4th, the weather was clear and warm; the noon observation gave 68° 47′ latitude, the longitude by reckoning being 0° 29′ W. of the balagan.

I had hardly finished the observation, when my whole attention was called to a highly interesting, and to me, a perfectly novel spectacle. Two large migrating bodies of rein-deer passed us at no great distance. They were descending the hills from the N.W., and crossing the plain on their way to the forests, where they spend the winter. Both bodies of deer extended further than the eye could reach, and formed a compact mass, narrowing towards the front. They moved slowly and majestically along, their broad antlers resembling a moving wood of leafless trees. Each body was led by a deer of unusual size, which my guides assured me was always a female. One of the herds was stealthily followed by a wolf, who was apparently watching for an opportunity of

seizing any one of the younger and weaker deer which might fall behind the rest, but on seeing us he made off in another direction. The other column was followed at some distance by a large black bear, who, however, appeared only intent on digging out a mouse's nest every now and then, so much so that he took no notice of us. We had great difficulty in restraining our two dogs, but happily succeeded in doing so; their barking, or any sound or motion on our part, might have alarmed the deer, and by turning them from their course, have proved a terrible misfortune to the hunters, who were awaiting their passage, on which they are entirely dependent for support. We remained for two hours whilst the herds of deer were passing by, and then resumed our march. After travelling twenty wersts, we arrived at the foot of another chain of hills which we had seen in the morning. We saw, to the east of us, another stream, flowing towards the Poginden; to the west, the hills rose into high and pointed rocks. The stream which we followed turned suddenly to the west, and conducted us into a valley, sheltered by the surrounding hills, and characterized by a more vigorous vegetation; the bushes no longer crept along the ground, and the grass was thicker and of better quality; the ground was less marshy, and on some sandy places we found a quantity of wild leeks. The sensible alteration in the temperature and in the vegetation, and the much greater rapidity of the stream, all indicated that we had decidedly passed the dividing ridge, and were now on its southern declivity. We slept five wersts below the above-mentioned bend of the river, at the foot of a hill of no great elevation, consisting

of conglomerate, near which a stream from the south falls into the Poginden.

On the 5th of August we had a fresh east wind, with a cloudy sky, which prevented the usual noon observation. We continued our route towards the west, following the valley of the Poginden, which is here only seven fathoms across, but so deep and rapid that it can only be forded where its course is interrupted by rocks, forming waterfalls: the hills to the south of the valley soon became insignificant, whereas those to the north preserve their height and steepness. Twelve wersts from our sleeping-place, I was delighted by the sight of a small wood. I had been eagerly looking out for the first trees, that by determining their latitude, I might follow up my observations on the limits of the woody region in the country east of the Kolyma. M. von Matiuschkin and I had agreed very nearly in placing this limit at two different points in 68° 54′. In the Tundra towards the Indigirka, M. Kosmin had found no trees beyond 68° 40′. Here the woody region terminated in 68° 36′, but this might probably be owing to the elevation of the ground. As we had gone thirty wersts, I determined to halt for the night under the shelter of a grove of larch. During the night a wolf swam across the river to us, but the barking of our dogs frightened him away before we had time to use our guns.

On the 6th of August the weather cleared a little, and the noon observation gave 68° 37′ latitude, the longitude by reckoning being 1° 28′ W. of the balagan, and the variation 14° E. The valley became gradually wider, and the gently-winding river alternately bathed the foot of the northern and of the southern hills. Its banks

were fringed with willow bushes and occasionally with flourishing poplars, alternating with the darker bluish-green of the larch-trees on the more stony ground. The number of weeks which had passed since we had seen so much verdure made it a very pleasing scene.

After a march of twenty-four wersts we halted for the night in a thick grove of willows. The valley was here five wersts broad, with the hills on both sides lower. Those to the north consist of mica slate.

On the 7th of August we had a strong breeze from the east, and a clouded sky. The noon observation gave the latitude 68° 12′, the longitude, by reckoning, being 2° 01′ W. of the balagan. In the afternoon the wind increased so much that we rode with difficulty, and the rain fell in torrents, but we could not afford to wait for better weather, as our provisions were almost expended. The state of the ground, from the heavy rain, rendered it impossible for us to accomplish more than sixteen wersts, and the exhausted condition of our horses forced us to allow them two days rest. Meanwhile the wind subsided, but it rained incessantly during the 8th, and on the 9th heavy snow fell. The swoln river soon overflowed its banks, and laid the valley under water. The rising ground, on which we had encamped, was entirely surrounded, and would apparently soon have been covered likewise, when, on the 9th, a sharp frost released us from our uncomfortable position. From this point the burnt stumps of trees, such as I had before seen on the Phillippowka, re-appeared ; they give a dreary character to this part of the valley of the Poginden. By reckoning, our latitude was 68° 41′, and our longitude 2° 25′ W. of the balagan.

On the 10th of August we travelled on with thick drifting snow. The mountains here gradually sink into the plain, and I determined on proceeding due south, so as to reach the lesser Aniui as soon as possible. We sought in vain for a ford, by which we might cross the Poginden, but its depth and rapid current baffled every attempt, and we were obliged to wait on its eastern bank, near a waterfall, till the subsidence of the flood would allow us to cross. During the night the water abated considerably, and at daybreak we hastened to try the passage across the rocks, which formed the water-fall, before the beams of the morning sun thawed the snow on the hills. We crossed safely though the water reached the saddle. We then ascended a stream which falls into the Poginden near this place, and hoped to find some grouse among the young larch trees, and high bushes, which covered its rocky banks. We were in great want of some reinforcement to our provisions, which, for four days past, had consisted only of a few rye biscuits. One of our guides, who was detached for a better chance of finding game, remained out of sight so long that we became uneasy lest some accident had befallen him. We discovered him at last, asleep, among some bushes near the river, quite exhausted by the long and fruitless search. He had killed only one bird, and we did not even see another until we reached the Aniui. The stream which we were ascending has a very short course of only eight or nine wersts: its left bank consists of black slate rock; there is a morass, with stunted bushes, on the right side. After passing the source of this little river, we followed for three wersts the southerly course of another

stream, near which we halted for the night. We saw to the east the Lobogen mountains, the summits of which are crowned at several places by pillars of rock, and from which the Lobogen river flows, and empties itself into the Aniui.

On the 12th we travelled twenty-one wersts across a marshy plain, to the west of the Poginden, about eight wersts distant. We saw in the same direction the Leledinski mountains, which extend towards the S.S.E., and approach the Aniui, near the mouth of the Poginden. Several hills, with pointed summits, were to the south of us, at no great distance. Our halting-place for the night was, by reckoning, in 68° 3′ latitude, and 2° 23′ longitude W. of the balagan.

Early in the morning of the 13th August we were disagreeably surprised, on waking, to find that our horses, which had been, as usual, grazing near us, had all disappeared, except one, which was old and feeble. They had probably been frightened and scattered by wolves or bears. We spent the whole day in a fruitless search for the fugitives, and returned to our tent late at night, weary and disappointed; the last biscuit had been eaten the day before, and a little tea and sugar were the only provisions which we had remaining. Our difficulties were further increased by finding that the Iukahir, who was supposed to be our guide, did not know where we were. He said that the hills before us were quite unknown to him, that the summits which he saw to the south were quite unlike those which approach the lesser Aniui, in the neighbourhood of Konowalow, where his tribe sometimes reside, and that we must still be a long way from the summer habitations of the Iukahirs. Unavoidable

errors in reckoning might certainly cause some uncertainty in my determinations of longitude, but our guide was not even able to say whether we were too far to the east or to the west. He was so far bewildered that he did not even recognise the Poginden river. The provisions being expended, our case seemed a bad one; there was no time to be lost in reaching the Aniui, which would conduct us to some inhabited place; I determined to continue our journey next morning on foot, if the horses were not found.

Early in the morning of the 14th, we packed up our tent and most of our things, and hid them in a place which could be easily recognised. We took with us our tea apparatus, and the instruments, and loading the old horse with them, continued our journey on foot, through rain and wind. We avoided the marshy places as much as possible, and made across low hills, towards the mountains to the south of us. It was a laborious day's march, sometimes wading through morasses, and across deep and rapid streams, and sometimes forcing our way through tangled thickets. At the end of eight hours exertion, we were so exhausted, that we were forced to halt, though we had only accomplished fifteen wersts. Luckily the rain ceased, and we had the comfort of drying ourselves and our clothes by a good fire, and after taking our unsubstantial supper of tea, we slept tolerably soundly, caring little for the absence of shelter. The next morning hunger made itself felt in good earnest, and became every hour more urgent. We were at first in hopes of finding in the burrows of the field-mice the sweet mealy root called Makarscha, which often affords a resource to the Iukahirs in such cases as ours, but

the mice do not burrow in marshy ground such as we were now on, and we found ourselves obliged to have recourse to another expedient in use here. We chose a healthy young larch tree, peeled off the outer bark, and then cut the soft inner bark into small pieces, which we boiled until the surface of the water in the kettle became covered with a resinous scum, which was carefully removed; the broth was then seasoned with salt and pepper, and in spite of the remaining particles of turpentine, it tasted well, and filled the stomach. We took it in moderation, and felt no ill effects from it.

Whilst we were breakfasting, the sky became overcast, and it rained occasionally throughout the rest of the day; the hills rose gradually into mountains, as we advanced towards the place, where by my reckoning I expected we should find the Aniui. After a march of thirteen wersts, we reached the highest point of the mountain-chain, whence we had a view of the surrounding country. The mountains still continued to the south-west, but immediately in front of us to the south was a deep valley, at the bottom of which we at length descried the eagerly looked for Aniui. Our guide instantly recognised the valley, the river, and the winter habitation of his tribe with loud exclamations of joy, and in spite of weariness and hunger, broke out into a merry national song. I was especially rejoiced at this confirmation of the correctness of my reckoning.

We had still before us nine wersts and a-half to the river, and two wersts more to the little settlement of Konawolowo, which we hoped to reach before night; but when we gained the bank of the river, after an uninterrupted walk of eleven hours and a-

half over difficult mountain-paths, we were so completely knocked up, that we preferred passing the night in the rain to attempting to proceed any further. Our Iukahir offered to go on to Konawolowo, and to bring us some provisions from thence. We impatiently awaited his return round a good fire. He came back at the end of an hour and a-half, empty-handed; he had looked into all the store-places of the inhabitants, who were absent on their various summer excursions, and had found nothing but melancholy evidence of the scarcity which must have prevailed. Too much wearied to begin preparing bark-broth, we comforted ourselves as well as we could with tea, and with the assurance of finding inhabitants and provisions, twelve wersts off, at Ostrownoie.

We started early in the morning of the 16th, and arrived there after a march of three and a-half hours, but only to meet a fresh disappointment. The inhabitants were absent for fishing or hunting, and had taken with them whatever had been left in their provision-stores, which were perfectly empty. Much cast down, we set about preparing another meal of bark broth; meanwhile I despatched my two companions to a summer habitation six wersts off at the foot of the Obrom mountain, where some of the Iukahirs usually await the migrating rein-deer, and where I hoped to procure some provisions from their chief. He actually did send us all the remainder of his provisions, consisting only of a piece of rein-deer meat, two rein-deer tongues, and one fish. The men brought us a sad account of the severe distress that had prevailed for some time past. The spring rein-deer chase had failed, and even now, when the deer were in full migration, only a

single one had yet been killed by these poor starving people.

As I learnt that a Cossack had arrived from Iakutsk with letters and money for the expedition, and had been waiting for me at Nijnei Kolymsk for the last month, I determined to return thither at once, instead of examining the upper part of the Aniui as I had intended to do. I therefore sent my Iukahir with two other trust-worthy men on horseback to fetch the things which we had left behind, and to catch the stray horses if they could, whilst I made the best of my way back to Nijnei Kolymsk by water. I embarked early in the morning of the 17th of August, and was borne quickly down the stream by the rapid current of the Aniui. Its winding course and verdant banks offered varied and pleasing prospects. As both the river and the adjoining district had been examined in detail by MM. von Matiuschkin and Kyber, whose account has been given in the IXth Chapter, I thought it useless to make any delay for a similar purpose, and arrived at Nijnei Kolymsk on the 20th of August, after an absence of two months. A week later M. Kosmin returned from the Baranika. The fishery had not been very productive, so that our chief hope rested on obtaining a sufficient supply of herrings, which were entering the Kolyma in large shoals.

M. von Matiuschkin had accomplished his purpose of penetrating as far as the Tchuktches. He arrived on the 24th of September, the latter part of his route having been a winter journey, as the Kolyma was frozen over on the 18th of September.

CHAPTER XIII.

M. von Matiuschkin's Journey across the Eastern Tundra in the Summer of 1822.

I PARTED from M. von Wrangell at the village of Pantelejiva on the 1st of July, in company with our former travelling companion and friend, M. Bereshnoi, who was going to Tchaun Bay. His objects were to trade with the Tchuktches, and to seek for mammoth-bones; mine was to execute the charge intrusted to me by the commander of the expedition of examining and surveying the district over which we were to travel. It was agreed that we should go round by Ostrownoie, where we expected to find a Tchuktche interpreter.

After crossing to the right bank of the Panteljiva, we loaded and mounted our horses, and began our journey by following for three wersts a narrow path along the mountain-side; we then turned to the east to avoid two rivers which were so swollen by the heavy rains, which had lately fallen, that we could not hope to be able to ford them: we rode till sunset over rocky hills clothed with wood, and marshy valleys intersected by streams, and crossed by twilight the Nuptschag, which rises in the White Rocks, and joins the Panteljiva eight or ten wersts above the village which we had left. The traces of the storm of

the previous day were every where visible, and our way was frequently impeded by the uprooted trees which lay across our path. We pitched our tent at night, and the horses were allowed to graze.

On the second of July the wood became gradually thinner as we approached the White Rocks, until there were only low bushes, with occasional stems of larch-trees which had been burnt. The morassy ground was overgrown with moss, and intersected in every direction by small brooks. There were here many marsh-birds, and it is the most northern station at which we saw them. As we advanced, both vegetable and animal life became more rare, except the immense swarms of mosquitoes, which continued to torment both ourselves and our poor horses, dreadfully. We hoped to escape them by halting for the night on a barren elevation, exposed on every side to the wind, but unfortunately it fell calm; it was in vain that we crept under horse-hair nets, or surrounded ourselves with thick and suffocating smoke from the smouldering heaps of moss and leaves; nothing availed, until the increasing cold of the night brought us a short respite; but as soon as the beams of the morning sun were felt, our tormentors renewed their attacks.

On the morning of the 3rd of July, we left the White Rocks, which gradually diminished in height towards the east, and took a southward course across a hilly country watered by several streams. At first we met only with bushes, but the woods soon became so thick that we had great difficulty in making our way through. We could not follow any one of the rivers, because, though they all flow towards the Aniui, they enter it a

long way to the westward, which would have taken us quite out of our course. We availed ourselves, as far as possible, of the paths which the rein-deer had opened in their south-eastern migration.

Early on the morning of the 4th we saw, above the trees, the summits of the two mountains Krugi and Nugpol, which are near the Aniui, and between which we were to pass to reach that stream. The forest, apparently hitherto untrodden by any human foot, became still denser and more difficult to traverse, from the tangled roots and branches of numbers of uprooted trees. We had frequently to open a path with hatchets, and sometimes could not advance more than half a werst in the course of an hour. The rein-deer tracks, which had hitherto befriended us, now ceased, and we had also many streams to cross; late in the evening we emerged from the wood on a treeless plain, extending from east and west, on which the Krugi mountain stands; we rode on to the east, and slept among some low woody hills surrounding the Nugpol mountain.

In one of the brooks which we crossed, we found a very fine mammoth's-tusk, which might weigh 2½ pood (100 lbs.) and the value of which M. Bereshnoi said would fully compensate him for all his expenses and trouble hitherto. Unfortunately, on a closer examination, we found that the greater part of the tusk was so firmly fixed in the frozen bed of the stream that all our efforts to get it out failed, and not having with us any pointed iron crow-bars, the prize had to be left behind, to the great regret of the whole party.

After riding six wersts on the morning of the 5th, we arrived at the summer dwelling of an

Iukahir family, at the foot of the Nugpol mountain, and on the bank of the Aniui river. By their advice we were ferried by them across the river, as they assured us that we should find the forests on the north side absolutely impenetrable; and that in the entire absence of any assistance from men or boats, we should have found great difficulty in crossing the Poginden, which falls into the Aniui further on.

We followed the left bank of the river, first through trees, and then over a marsh; which delayed us so much, that we could only accomplish twenty-five wersts in the course of the day. We passed the night at a small Tchuwanzian settlement, to which we crossed the river. We found these poor people suffering terribly from hunger; they had no fishing nets, and had scarcely caught any thing with lines and baskets for some time past. We gave them some of our provisions, and their gratitude knew no bounds. Next morning, as we continued our journey after re-crossing the river, they followed us for some distance along the opposite bank, with shouts and songs. We passed the rest of this day, (the 8th) and the whole of the 9th of July, at a little settlement opposite to the Obrom mountain, partly on account of the slight illness of one of our company, and partly to allow our horses to rest.

On the 10th we descended the river to Ostrownoie, on a raft formed of stems of trees, our horses following by the river bank. We engaged a Tchuwanzian chief, who understood the Tchuktche language, as our interpreter. This and other preparations detained us until the 12th, when we crossed the Ostrownoie river, and slept fifteen wersts further on. On the 13th we had clouds

and rain, which lasted for a week; we passed over several wooded hills, and slept near the sources of the Konawalowo river. On the 14th we directed our course across a barren plain, to a considerable wood, which appeared at a distance to be traversed by a large and winding river, which we supposed to be the Poginden. It was late at night before we discovered our error, on arriving on the banks of an inconsiderable stream, where we slept. The country through which we had travelled, was almost a desert; we did not see a single bird or beast, and we longed to arrive at the lakes on the tundra, where we hoped to find wild geese and fish, as our provisions were getting very low. We arrived on the 15th at the Poginden, and pitched our tent on its bank, in a thick grove of poplars, while some of the party tried the fishing net, and others looked out for a ford. The woods here consist of fine poplars, aspens, and a very ornamental kind of willow, with long slender branches; there are excellent pastures on the higher banks of the river, and many flowering and sweet-smelling plants. We gathered a quantity of wild leeks, which made a very good addition to our scantily provided soup-kettle. No fish were taken in the net, nor could we find any ford. We hoped, however, that the river would be lower next morning, as is often the case with the rivers in this country, in summer, from the brooks and smaller tributaries freezing during the night.

At daybreak on the 16th, we found that the water in the Poginden was lower by two feet; we crossed it at a part where it divides into three arms: the first was easily passed; in the second the water was half over the horses' bodies; and in the third we nearly lost one of our pack-horses.

We were crossing above a waterfall, where the current was strong, but the ford was in other respects the best we could find; we had turned our horses' heads obliquely up the stream, so that their whole strength might resist the force of the water, and had reached the opposite shore in safety; but whilst the foremost horses were slowly climbing the steep bank, the last was overborne by the strength of the current, lost his footing, and must inevitably have been carried down the fall but for the long string by which he was fastened to the other horses.

We advanced in a northerly direction, and saw from the top of a hill, a wide marshy plain extending to the Filatow, one of the three principal tributaries of the Poginden. We followed the edge of the marsh, until we found a favourable opportunity of crossing it.

The Filatow is every where very rapid, and forms a number of gravelly and sandy islands overgrown with willows. It is very inferior in size to the Poginden, not being above ten or fifteen fathoms across. We slept on its right bank under the shelter of a bluff cape wooded with larch: heavy rain fell all night. High hills extended northwards as far as we could see up the course of the stream, and the chain appeared to terminate to the south-west about twenty wersts from us in a high rocky mountain. We saw numerous rocks, from which the earthy covering had apparently been washed away; their singular forms might easily be construed by a lively imagination into colossal figures of men and animals, or into old buildings.

We continued our journey on the 17th through rain, and sometimes snow, and at the end of ten

wersts arrived at the Fedoticha river, which joins the Filatow in latitude 69° 3′. The wood ends here; on the opposite side of the Fedoticha we saw only a few willow bushes; before crossing it we provided ourselves with a supply of tent pegs, as we knew we should not find any in the tundra. During the rest of our day's march we had many streams to cross. At night we were roused by the barking of our dog at the approach of a black bear, but the darkness prevented us from following him, and he soon escaped.

On the 18th the weather was so bad that we could see nothing of the country through which we passed, except that our way lay between rocky hills and mountains, and that gradually the valley became narrower and wilder, until at length we had no footing but the rocky bed of a former torrent. Dark ravines occasionally opened on either side of us. The Iukahirs said that this gloomy scene was the summer resort of powerful demons, notwithstanding which, they themselves visit it (with many precautions) in autumn, to hunt the wild sheep which are attracted by the wormwood that grows here in great abundance, as well as on the banks of the Beresowaia or small Baranika. We arrived at the latter river, and followed it for a short distance, but the violent gusts of wind through the ravines rendered it so difficult for the horses to keep their footing on the slippery path, that we were obliged to halt for the night, and to shelter ourselves as well as we could behind a projecting rock from the thickly-falling snow.

On the 19th the weather improved, the hills became lower, and the valley gradually widened, until when we halted for the evening it was above

twenty wersts broad, and we began to meet with the small lakes which characterize the tundras. M. Bereshnoi found a mammoth's tooth here, and I shot a fat wild swan, which at the time was rather the better prize of the two, as our stock of provisions was reduced to a few biscuits. It was, moreover, a good omen, for we were woke early the next morning by the noise of immense numbers of moulting geese which almost covered the lake near us. We were soon on horseback, and armed with bludgeons surrounded the lake that they might not escape; our dog drove them on shore, and we knocked down seventy-five. Less experienced than my companions in the use of the weapon, and less well acquainted with the tricks of the geese, which rather resemble foxes in cunning, I only succeeded in killing one. When I saw them lying on the ground with their necks and legs stretched out quite stiff, I passed them by, thinking them dead, and went on to try to knock down others; but when I turned back to pick up the slain, they slipped out of my hands with wonderful agility. The natives are never taken in by them in this way; they deal their blows on every side with remarkable skill and quickness, and the whole scene presents on a much smaller scale somewhat of the animation of the autumn rein-deer hunt. In great spirits at this seasonable supply we loaded our horses with the game, and continued our route towards the coast. My companions thought themselves still thirty wersts from it, when I found by the meridian altitude that we were only five wersts from the sea, which was concealed from us by some intervening low hills. We slept that night a few wersts east of the mouth of the Beresowaia.

On the 21st of July we joined M. von Wrangell at the balagan near the great Baranika. On the 31st we crossed the three arms of that river in M. Kosmin's boat, but were prevented from proceeding further for twenty-four hours by the sudden illness of our interpreter; on the 1st of August he was so much better that we were able to continue our journey. The geese, which had now completed their moulting season and were in full plumage, flew over our heads in large flights to the southward, and we could not even shoot one, but we killed nine pair of swans which were now in full moult: these birds do not keep together in flocks, but are usually seen in pairs, or at the most in parties of four. We came some wersts further on to a space of nearly half a werst between a low hill and the sea, where the grouud might be said to consist entirely of mammoth and buffalo bones: but a travelling party, the traces of whose fires we saw at a little distance, had been here before us, and had carried off all the valuable part of the spoil, namely, the teeth. We saw large heaps of jaw-bones, which had evidently been thrown aside by them.

On the right bank of the Kosmina, we found, to our surprise, M. Kosmin, who had come here by sea with four companions in his boat for fishing. They had been very successful the first night, but the next day a north wind drove so much ice into the river, that they could do no more for some days. I suspect that this so-called river is nothing but a long narrow arm of the sea, for the fishermen who had gone twenty wersts inland to the south-east to shoot birds, said that they found the breadth still the same, and the water too salt to drink.

On the 3rd of August we took leave of M. Kosmin, who, with his people, had helped us to make a light boat for crossing the larger rivers. Our party consisted of M. Bereshnoi, his interpreter the Tchuwanzian chief Mordowskij, three Iakuts, and myself. We had sixteen riding and pack-horses.

On the 4th of August I had separated myself from the party, to gain a better view of the country from higher ground, when I came on a large flock of geese, which were later than the rest in moulting. I left my horse grazing, and quietly approaching the birds from the leeward side, succeeded in knocking down several. Meanwhile one of our Iakuts had been sent to look for me by the party who were uneasy on my account, and he continued the chase with good success.

On the 4th of August we halted in a large deep valley, which had apparently been a lake at some former period. The steep shores which surrounded it appeared a promising locality for mammoth-bones, but the result did not correspond to the expectations which had been formed; during the two next days many bones were found, but no very valuable teeth. Two rein-deer were shot near a lake. From the top of the hill we saw, 100 wersts to the east, the high mountains of Vojvaiuna, Geilla, Rautan, and Cape Schelagskoi; we could also plainly distinguish the bluff rocks to the east and south of Tchaun Bay, so that I was able to take several very useful angles for my survey of the country.

M. Bereshnoi determined to lose no more time in searching for mammoth-bones, but to consider a trading communication with the Tchuktches as

henceforth the principal object of his journey. On the 7th of August we took a south-westerly course between low hills and across lakes, which were generally frozen, to what is called the Bolschaia Reka, or great river, but which is, in fact, the western entrance of Tchaun Bay, which had been hitherto mistaken for a river; we arrived there after a short march.

I must remark here a curious natural feature of the country. Since quitting the Kosmina river, we had been passing numerous deep lakes, so close together that they were usually only divided from each other by dams of earth, a foot or a foot-and-a-half broad. Yet the level of the water in the different lakes, so far from being the same, often differed as much as one or two feet; they can therefore have no communication with each other, but as the thin separating dikes consist only of vegetable earth, we must suppose the dikes to be consolidated by ice which never melts; this would explain the remarkable coldness of the water of these lakes, which, in many instances, were frozen; but it is singular that neither the summer sun, nor the action of the water on both sides, should be able to penetrate such thin banks.

Tchaun Bay has two entrances, divided from each other by the island Aiun (called Sabadàt in older maps), the north point of which forms a low sandy cape. The whole island appears to be of a similar character; neither bushes nor grass are to be seen on it, but only moss. The western entrance, near which we were, is the smaller of the two. When M. Bereshnoi was here, in the preceding summer, he had found only two feet of water, so that it could be waded through with ease; but now northerly winds had raised its level

considerably, and the breadth of the bay was from ten to fifteen wersts.

The narrow strip of sand on which we stood was almost covered with the shells of a kind of muscle, which is abundant in the Aleutian islands, and at Sitka; they were partly overgrown with large-leaved sea-cabbage, and other maritime plants. We also saw many shells of shrimps, and a muscle-like kind of shell-fish, which appeared to me to be Digitellus crassus.

We had had, since the early morning, a sharp east wind, and a perfectly clear sky. At noon we saw a beautiful phenomenon, which my companions said indicated approaching bad weather of long continuance. The sun was surrounded by four mock suns, at equal distances from each other, connected by a circle of beautiful prismatic colours, of which the radius was 22°. The true sun, and two of the mock suns were intersected besides by a horizontal prismatic arc, extending 80°, having two smaller bows at the two ends. These, which were perpendicular to the horizon, had peculiarly bright and sharply defined colours, but in reverse order to the rainbow. The phenomenon lasted two hours, and then gradually disappeared. The wind fell soon afterwards, and the bad weather, which had been foretold, began by falling snow.

We slept in a narrow valley, which afforded good grass for our horses, and drift-wood for ourselves. The ground on which our tent was pitched had only thawed to a depth of three inches.

On the 8th of August we continued our march along the low beach at the foot of a steep earthy bank, from three to seven fathoms in height, full

of roots, plants, and fragments of resinous shrubs; it was obviously of recent formation, and contained no trace of mammoth-bones.* A place where the earth had given way, showed us a curious section of one of the small lakes which had dried up; the basin was only five feet deep; it was lined by two coats of ice, separated from each other by an empty space: the upper layer of ice was covered with earth, on which were growing several creeping plants and shrubs. About noon, we came to a deep, though not broad river, which enters Tchaun Bay by two arms, and across which we swam our horses, and conveyed our luggage in the boat; this river appeared to come from the westward, and I regard it as being most probably another outlet of the Kosmina. The bad weather, and the number of small lakes rendered our progress difficult; during the night the hills were covered with snow, and on the 9th, the wind and thick-falling snow concealed almost every object from our view. We met with many tracks of bears, and with a board which seemed to have formed part of a wreck. As we approached the Vojvaiuna mountain, we had firmer footing, over fine gravel, and along the foot of cliffs of black-slate, intersected with veins of quartz. Towards evening the weather cleared, and the wind became due north. Very little ice appears to drift into Tchaun Bay, probably owing to the existence of shallows near the entrances. We saw, at two or three miles from the coast, an insulated rock,

* At several places along the coast we found old weathered drift-wood at the height of two fathoms above the present level of the sea, whilst fresh drift-wood lay on the lower level. Does not this appear to indicate a change having taken place in the relative levels of the sea and land?

resembling a frigate with the wind abeam. I supposed it to consist of quartz, both from its whitish-grey colour, and from its having withstood the shocks of waves and masses of ice, which would not have been long the case with a slate-rock. Our route on the 12th August was still along the coast, but over a spur of the Vojvaiuna mountain; the bad weather had returned; we slept in a narrow valley, where we had good grass and drift-wood. On the 13th, we shortened our journey, by keeping inland, and cutting off a projection of the coast, and emerged again on the sea-shore at the end of seven hours, when, as I was riding carelessly on at some distance from my companions, on turning suddenly round a rock, I came upon a bear engaged in devouring a seal. Escape was impossible, for the bear had caught sight of me, and, leaving the seal, made furiously towards me. Defence was equally out of the question, for I had no weapon, except a short knife in my girdle. I recollected, at the instant, having heard the native hunters say, that a bear would not meet the fixed eye of a man, but would fly from him; so I sprang from my horse's back, and went forward as boldly as I could. The bear, however, was not in the least disconcerted by my steady look, and it would probably have fared badly with me, if at this critical moment my dog had not sprung forward, and by his loud barking put the bear to flight. I carried off the seal as a trophy, and it afforded the party a very acceptable addition to our reduced stock of provisions.

We had now been travelling nearly six weeks without reaching the country of the Tchuktches, the object of our journey; the time had far ex-

ceeded M. Bereshnoi's calculations, and the advanced season and bad weather made him fear that our return might prove a winter journey, for which we were wholly unprepared. He held a very serious conversation on the subject with our principal guide, the interpreter, who at last admitted what I had long suspected, namely, that he had been guiding us by conjecture hitherto, and that now he was at a loss where to look for the dwellings of the Tchuktches. Our annoyance and vexation may easily be imagined. I had at least had the satisfaction of surveying the country and the part of the coast which we had travelled over, conformably with my instructions, but M. Bereshnoi had obtained nothing but a few mammoth-bones, in return for all the labour and expense which he had incurred; both of us had missed the principal aim and most interesting object of our journey, a communication and acquaintance with the Tchuktches, in their own country. M. Bereshnoi determined, in consideration of the lateness of the season, to return to the Kolyma by the shortest way across the tundra. It was not for me to offer any opposition to his decision, which was, no doubt, founded on the experience of many years, and on great knowledge of the country; so we set out on the 14th of August, greatly disappointed at the failure of our hopes, and turned our steps, in the first instance, towards a range of mountains which we saw to the eastward, and from which we hoped to obtain such a view of the country as would enable us to determine on the best line of march. After riding twenty wersts we arrived near the foot of the mountains, which were separated from us by a deep and rapid river, which we crossed with a

good deal of difficulty, and encamped, after nightfall, on the high bank on the opposite side.

A very agreeable surprise awaited us with the first beams of the morning-sun; accident had conducted us better than our guide, for we were within the boundaries of the Tchuktche land. The river which we had crossed was the Taunmeo, and near it were many Tchuktche yourtes; we hastened to them, but they were all empty. The marks of habitation were still so recent that the wind had not yet blown away the light ashes from the hearths, and though bones and other remnants of food were scattered about, the wolves had not yet been attracted by them. As the inhabitants of the valley could not be far distant, I climbed a neighbouring hill, from which I hoped to have an extensive prospect, in company with the interpreter, who professed to recognise the country, and called the mountain on which we were Geilly: but before we reached its summit we were enveloped in thick mist. This, and two signal-shots from our companions, obliged us to descend. M. Bereshnoi, who still adhered to his intention of returning, had proceeded up the river with the rest of the party, and had left a Iakut to await us, with our horses. We mounted, and soon overtook our companions.

The valley of the Taunmeo has a considerable breadth, and, like most of the valleys of this region, is interspersed with numerous lakes. It is bounded on either side, first by flat hills, and afterwards by towering masses of rock. In places sheltered from the cold northern blast we found bushes of dwarf-birch, which furnished us with a scanty supply of fuel for cooking. During our whole day's march up the river, on the 16th of

August, we saw numerous traces of Tchuktche dwellings, but no people; the place appeared quite deserted. Yet we met large herds of rein-deer, which, so far from being shy, allowed us to approach them so closely that we could not but suppose them to have been domesticated, and to be the property of the absent inhabitants of the valley. We subsequently learnt that our belief in this respect was well grounded, and that the Tchuktche, to whom they belonged, had fled on seeing us.

The further we receded from the coast the warmer the air became, and towards evening, we were again tormented by mosquitoes, which were fortunately soon dispersed by a north-west wind. We saw here and there plants of the black crowberry (Empetrum nigrum), the whortle (Vaccinium uliginosum), and the cloud-berry (Rubus chamæmorus), but, probably owing to the cold summer, none of them had fruited.

On the 17th we had such a violent north-west wind, with rain and snow, that we were forced to halt; but the storm made it impossible to pitch the tent, and the heavy rain baffled all attempts at kindling a fire. At night the rain and snow were succeeded by frost, and in our wet clothes we suffered much from cold, as the storm of wind still continued, and constantly extinguished the little fire which we tried to make with the few twigs we could collect.

On the 18th we gladly put ourselves in motion at day-break, to warm our chilled limbs by exercise. The lakes were frozen over, the morass was everywhere hard and passable, and the bays in the river showed margins of ice.

On the 19th we made only a short day's journey, as we had before us a difficult passage over

a mountain-range, and it was necessary to spare our horses. We had no fuel, and our only food was a small quantity of dry biscuit.

On the 20th we turned to the westward along the tracks of several herds of rein-deer. In a plain between two rivers we came upon a pathway, which we afterwards learned was that followed by the Tchuktches in their journey to Ostrownoie. I proposed to pursue it, but as a stranger in the country, I was outvoted by my companions, and we turned instead up one of the rivers, which soon conducted us into a deep and rugged valley bounded by steep rocks, the fantastic forms of which appeared still more strange through the mist, which presently became so dense, that we could see nothing but a few projecting points. The rushing of the torrents on every side, sometimes rolling down large masses of rock, the howling of the storm through the ravines, and the thickening fog which now concealed every object from our view, made the scene a most desolate one: completely ignorant as we were of the locality, our further progress was no less dangerous than toilsome: at length we perceived that the ground under our feet became still more steep, and the sound of the river more distant; we were in a narrow ravine, which would probably lead to precipices; we therefore dismounted, and led our horses for two hours, during which we toiled on over loose stones. In this manner we reached a spot where the path seemed to end suddenly, and a precipice lay before us, of which we could not see the depth, on account of the mist. Further advance was impossible, and the exhaustion of our horses made it equally so to return to the place we had left, now thirty wersts distant, where there

was pasture for them. Whilst in this perplexity, we heard the sound of a herd of rein-deer; we hastened in the direction and soon got sight of them, but they had scented our approach, and quickly disappeared in the mist. Their tracks, which we followed, led us through a ravine to the south-west, and after winding up it for some time, we arrived at the summit of the range.

We now emerged from the mist, but a sea of clouds still concealed every thing beneath, and the little spot on which we stood, seemed like an island in the midst of the ocean. The ascent had been laborious, but the descent was far more dangerous: for half the way down (about 100 fathoms perpendicular height) we were guided by the track of the rein-deer, and we had reason to admire their judicious selection of the ground; but the other half was over loose gravel and fragments of rock, where we could no longer trace the footsteps of our guides. By keeping an oblique course down this steep and difficult slope, still leading our horses, sometimes supporting them, and sometimes supporting ourselves by their aid, we reached a lake at the bottom; the shore consisted of gravel, and we had to go a few wersts further to find pasture. Our horses were thus provided for, but for ourselves we had only a few scanty crumbs of biscuit and fish, the sole remains of our store. Most of the party were cheered by the hope of next day seeing the woody region and the Aniui, where they might expect to find food and shelter. They thought that they had just crossed the dividing range of mountains, whereas I felt almost certain that it was still to the south of us; but my reasons, being chiefly theoretic, had little weight with my companions.

At daybreak it became evident, that unfortunately I was right; we had gone astray, had crossed a N.W. branch of the principal chain, and were now on an arm of the Baranika. But still the opinion of the Tchuwanzian guide prevailed, and we went forward in the same direction. We were all on foot, as our horses were nearly knocked up, and our only food consisted of some wild leeks, and a few roots which were found in a mouse's burrow.

At daylight on the 22nd of August, the aspect of the country, and the characteristic sea mist rising before us in the direction in which we were going, at length opened the eyes of my companions, and even the Tchuwanzian owned that he did not remember ever having been here before. It was acknowledged that my opinion had been the more correct one, and I was asked to undertake the further conduct of the party. By my reckoning, we were two day's journey from the Aniui, towards which we at once begun our march, travelling on foot through ravines and over rocks, for twenty-five wersts, when we were too exhausted to go further. A fire was lighted, and the kettle hung over it as usual, but we had absolutely nothing eatable to put into it. Whilst we were gathered round it in silence, one of the Iakuts called me aside, and taking a wild duck out of his havresack unseen by the rest, told me that he had killed it with a stone, when he was accidentally a little behind the party. "There," said he, "take and eat it alone, it is too little to do good to all of us, and you are very tired."

I thanked him most heartily for such disinterested kindness, and put the duck at once into the kettle. Weak as the broth was, and little of

it as fell to the share of each, we felt strengthened by it. The cloudless sky made us hope for a fine day for crossing the mountains, but in the night a violent wind rose, and next morning the ground was covered with snow. The ascent of the mountains was rendered more fatiguing by often having to wade up to our knees in snow; but at length we reached the summit of the ridge, when the sun broke for a moment through the clouds, and showed us on every side steep snow-covered hills. In our descent, the snow saved us from material injury in the frequent falls which we met with. We reached the foot of the mountain by dusk, much bruised. Notwithstanding our weariness, we had little sleep that night, for, after three days' fast, and continued exertion, the pangs of hunger were acutely felt by all.

On the 24th, we climbed a lower range of hills, from the summit of which, to our great joy, we saw a wide valley, with numerous groups of trees; and by night-fall we reached a small lake at the foot of the hills. I now proposed to kill one of the horses, but the Iakuts said, that in the heated state of their blood, the use of their flesh as food would be certain to occasion severe illness. We had just strength enough remaining to place a net in the lake, before we sunk on the ground exhausted with hunger and fatigue. The sun was high when we woke next morning (25th of August); no one seemed willing to draw the net, for all feared that it would contain nothing, and dreaded to be assured that it was so; when at length we made the effort and the net was drawn, it contained three large, and several smaller fishes; expressions of thanksgiving, of joy, and of mutual congratulation, were heard on

every side; a fire was made in a few moments, and an excellent broth, seasoned with wild leeks and herbs, soon appeased our hunger, and in great measure restored our strength.

When the meal was finished, we resumed our route, and, after going round the lake, we came in sight of the Aniui; before arriving at it, however, we had to cross a torrent, which, with our exhausted horses, was no easy matter. The bed of the river was strewed with large blocks of stone, and the water was often up to the saddles. After going five wersts further, and fording or swimming several other streams, we reached the Aniui, near the mouth of a small river.

Two flights of geese were passing to the southward, a hawk pursued them, and pounced on a goose, which fell to the ground dead, but before he could carry off his prey, we had come up and secured it.

We halted on the 26th, in a grove of poplars, near the confluence of the Schichutina with the Aniui, and before night-fall constructed a weir across the former river and set our net: on drawing it up again, at the end of an hour or two, we found more than 200 fish of various sizes; having made an excellent meal, we cast the net again repeatedly, and took in all about 800 fish: we did not lie down to rest until the day began to dawn. The night is the most favourable time for this fishing. On the 27th, the net was down the whole day without taking a single fish; and in the following night we caught 2000. We were now so rich in fish, that, notwithstanding the enormous appetite of the Iakuts,* we could not eat them all,

* The appetite of these people is extraordinary; each of them would eat daily sixty fish, or more, when I found ten of the same size quite sufficient.

and with the recollection of our own hunger fresh in our minds, we prepared a deposit for the use of other travellers, who might not arrive at so favourable a season. We constructed a Saiba on two larch-trees, and placed in it 5000 fish, which we were sure would keep good, as the frost had now set in decidedly. We erected a large wooden cross to draw attention to the spot, and some months afterwards, had the pleasure of hearing that some wandering families, when reduced to the extremity of hunger, had happily arrived at this place, and that our store had saved them from perishing, and had supported them for a whole month. We had passed the 29th in forming this deposit, and meanwhile our horses were recruiting their strength, as the pasture was still good, though covered with snow. The 30th of August was a day dear to every Russian, as the name-day of the Emperor Alexander: we celebrated it as well as we could; in the afternoon we had shooting at a mark with bows and arrows; a large travelling-knife, a hunting-knife, and a bridle, formed the prizes, and the wild shores resounded with our songs. A very opportune and agreeable circumstance closed this cheerful day. As we were to start early on the following morning, the Iakuts were collecting the horses from the wood, when they came to a Saiba, where several winter-garments had been deposited. Our own clothes were nearly worn out by the journey, and could ill protect us from the daily-increasing cold; we took from the store as many fur-shirts, gloves, and boots as we required, and placed in their stead an ample compensation in tobacco, powder and shot. We also erected a large cross, to which we affixed a direction to our fish-store.

Direction-marks of this kind, for various purposes, are frequently met with in these wildernesses.

At day-break, on the 31st of August, we loaded our horses, refreshed by five days' rest, with our baggage and a store of about 1000 fish, and resumed our journey. Steep hills obliged us to cross the Aniui repeatedly, but this was not difficult, as, from the freezing of the smaller streams, the water was low.

On the 4th of September we came to some yourtes, inhabited by five families, who cleared out a large balagan for our reception. Our Iakuts were delighted at meeting with auditors, to whom they could relate their travelling adventures with as many embellishments as they pleased; nor was our presence the slightest restraint to them in this respect. There was good pasture here, and M. Bereshnoi resolved to remain for a time to rest both himself and his horses. I determined to employ the short remainder of the season in surveying the Aniui to Nijnei Kolymsk, a distance of 500 wersts. I had a raft constructed of trunks of aspens, bound together by willow rods, navigated by two oars,* and on the 6th of September I began my voyage down the stream, accompanied by a young Iukahir, recommended to me as knowing the rocks, shallows, and rapids, by his father, with whom I left my gun and ammunition, for the hunting-season, in return for his son's services. Our vessel was awkward and very difficult to manage, especially when we came to falls: on the

* These rafts are made of nine or ten stems of trees, of a light kind of wood (straight aspens or poplars) the ends of which are drawn together to a point. At the other end the stems are spread out in a fan-like manner, and small boards are pushed into the interstices: the whole is bound together by willow rods. Such a raft is very solid, and its form makes it move through the water tolerably fast.

9th we reached Mungol, on the 11th Plotbichtche, and on the 12th Maloii Wetrennoie. I had visited all these places in the preceding summer, with Dr. Kyber, when the banks were lined by busy and successful hunters; now, birds were roosting in the deserted huts, and wolves were prowling round them. On the 12th we met with the family of Korkin, who had entertained me so hospitably when I was last here, and who had now only one meal in forty-eight hours. Our raft was much injured, and unfit to encounter the floating ice which we began to meet with. As we were trying to repair it, Korkin came most kindly to offer me the use of his boat, in which we departed on the 13th. We put up a sail, and, with a favouring wind, soon reached Molotkowo. Notwithstanding the rapidity of the current, there was already so much ice that we had occasionally to break through it with some difficulty; but the severe frosts were now so close at hand, that I feared we might be frozen up in the stream at a distance from any inhabited place, and I therefore hired seven dogs, which I took in the boat, in order that in case of such an accident we might proceed along the ice. In the evening, just as we approached an island covered with larch-trees, our boat was caught between two large masses of ice, and crushed to pieces. We got safe to shore on the island, and succeeded in saving our things likewise. As we might be detained here some days, we built a hut of branches, and covered it, first with moss, and then with snow, over which we poured water, which froze immediately, so that we had a very comfortable and air-tight dwelling. Our dogs were tethered outside, to guard against a surprise by bears.

We waited here two days, till the ice was strong

enough to bear us, and on the 18th we crossed to the right bank of the stream, close to which we drove slowly along, as our dogs were weak, and the ice still so thin, that it sometimes broke under us. On the 20th it became apparently quite solid, and on seeing smoke on the left bank, I attempted to cross, but in the middle of the stream the ice gave way, and I should have been drawn beneath it by the current, but for a pole which I carried with me, and which supported me, till the guide threw me the end of a very long thong by means of which he drew me out. On the left bank we found a Lamut family, whose rein-deer had been destroyed by wolves, and who were supporting themselves by fishing. They had been successful, and had collected a large store of dried and frozen fish, of which they let us have as much as we wanted for ourselves and dogs. In the night the "warm wind" set in, and weakened the ice so much that we were detained two days. On the 23rd we were enabled to proceed, and on the 24th I arrived at Nijnei Kolymsk, after an absence of ninety-four days. My papers had been so thoroughly wetted, that I had great difficulty in deciphering them, so as to draw up from them the survey of the country through which we had travelled.

CHAPTER XIV.

Fourth Journey on the Polar Sea.—Survey of the Coast, as far as the Island of Koliutchin, in 1823.

THE winter of 1822—23, was generally considered a very mild one at Nijnei Kolymsk: the temperature was only once as low as —51° (on the 10th of January), and auroras were rare, and not so brilliant as usual.

Whilst we were engaged in various preparations for our spring expedition over the ice, and in arranging our surveys and other papers, the monotony of our life was cheered by the arrival of M. Tarabukin, who had recently been nominated to the command of the Kolymsk district, and who took a warm interest in the success of the expedition.

The fisheries on the Kolyma had been generally successful, and the sickness among the dogs having entirely ceased, their numbers had again augmented. These circumstances were highly favourable for obtaining the requisite means for our journey, and M. Tarabukin, always just and considerate towards the inhabitants, by his judicious exertions, guided by a long knowledge of the people and country, obtained for us in excellent time all the provisions which we were in want of. Knowing the great uncertainties attending

a sufficient supply of dogs, and the large proportion which would probably be found useless when collected, I applied to the dwellers on the banks of the Indigirka, the Chroma, and the Iana, whose dogs are usually well trained, as well as to the inhabitants of the Kolymsk district, and travelled myself to those rivers in November, remaining a few days at Ustiansk where Lieutenant Anjou gave me every assistance in his power. Having obtained the promise of fifteen good teams of dogs, with provisions for them for two months, I returned to Nijnei Kolymsk, which I reached at the close of the year.

Our great journey could not be begun till late in February, but on the 30th of January 1823, M. Kosmin started with two sledges for the Bear Islands, to ascertain beyond doubt the true position of Krestowoi Island, and to assure himself of the existence or non-existence of the other island of the same name, of which we had been told. He returned on the 17th of February, after a journey which the season had rendered severe, and gave me a very exact survey of the islands generally, and of Krestowoi in particular. He had made a thorough examination of the space around for a considerable distance without discovering any island besides those which we had previously visited, and it may therefore certainly be concluded that no other island exists.

Not only our own people, but also most of the inhabitants of Nijnei Kolymsk were in full activity in preparing for our last great journey, in which we hoped to complete the fulfilment of the duties intrusted to us by our instructions. Old sledges were repaired or improved, new ones made, our travelling tent put into order, &c. I

found that I should have a sufficient number of sledges and dogs, to enable me to divide the expedition into two parts, one of which under M. von Matiuschkin should survey the coast of the Tchuktche country as far as Cape North, whilst the other under my own command should proceed in search of the supposed northern land. Dr. Kyber joined M. von Matiuschkin, hoping that the coast would afford more of interest in natural history, than the ice of the sea could be expected to do, and I was accompanied by M. Kosmin.

On hearing that the dogs were arrived from the west, I went on the 22nd of February with M. Tarabukin to Pochodsk to receive them; but unfortunately we found that the greater part were altogether too weak to be depended upon for a journey over the Polar Sea. We took the few good ones with us to Sucharnoie, where sixty chosen dogs, the establishment for five sledges, had been previously assembled; and on the 26th we took our departure along the coast to the eastward. On the 1st of March we were overtaken by a Cossack who had been sent on from Nijnei Kolymsk, with despatches and instructions from the Governor-General of Siberia.* I sent back with him two of the Indigirka sledges, as the dogs showed symptoms of an infectious distemper. We continued our journey with nineteen sledges, and reached the same day the balagan which we had built near the Baranika,

* These papers had been conveyed the enormous distance of 11,000 wersts from St. Petersburg to the mouth of the Beresowaia on the Polar Sea, in only eighty-eight days, including a short detention at Iakutsk for the purpose of drawing up instructions conformably to the orders received from the capital). The ordinary post would have required at least six months and a-half for the journey.

and which afforded us a very welcome shelter, the cold having increased to — 42°.

We now proceeded to distribute and pack the stores which we found here, as well as those which we had brought with us. Our provisions consisted of 7½ pood of rye biscuit, 6 pood of frozen fresh meat, 3½ pood of grits, 1 pood of saturan,* 1260 jukola, 224 salmon-trout, 12 geese, 12 lbs. of tea, 10 lbs. of sugar, 15 lbs. of sugar-candy, 8 jars of spirits, 20 lbs. of salt, 20 lbs. of oil, 1 pood of Circassian tobacco, 5 pood of train oil, and some fire-wood. For the dogs we had 7580 juchala and jukola, 4116 herrings, and some other fish. Besides provisions we carried a uross or tent made of rein-deer skins, 2 crow-bars, 2 spades, a tea and a soup-kettle with an iron trivet, 5 guns, 5 pikes, 100 cartridges, a pocket-lantern and some wax-lights, two sextants, 2 artificial horizons, a pocket chronometer, 8 telescopes, a dip circle, 2 pocket azimuth compasses, 2 spirit thermometers, 1 lb. of quicksilver, and a sounding-line. It took us three days to arrange all these things in our sledges; and on the 4th of March, when we were ready to start, we were detained by a tremendous storm from the W.N.W. We thought the balagan would have been blown down by the force of the wind, but it stood, and afforded us valuable shelter: the temperature was —24°; our dogs and sledges were buried in the snow. On the 5th of March, the storm having nearly subsided, we dug them out, and resuming our journey, arrived on the 8th at Cape Chelagskoi, where we were accidentally brought into contact with a people with whom we had long wished in vain to become better acquainted.

* See page 75.

M. Kosmin and I had gone some way in advance to select a good halting-place, when we saw coming towards us a sledge drawn by rein-deer, and driven by a Tchuktche. He stopt at a short distance and called to us; but perceiving that we did not understand him, he made signs to us to come nearer: we did so; and as I was extremely anxious not to lose so favourable an opportunity, I made every sign I could think of to detain him till we could be joined by the interpreter. I do not know whether he comprehended me, but without showing the least fear or embarrassment he got out of his sledge, and held out his gansa or pipe to ask for tobacco: we hastened to give it him, and he began to smoke very composedly. After a few minutes he repeated several times the word Kamakai, which means elder or leader, and then suddenly getting into his sledge again, we soon lost sight of him among the hummocks.

In the evening when we were all assembled, we received a visit from three Tchuktches, two of whom were in sledges, and the third ran along by their side driving the rein-deer. As they approached our camp, one of those in the sledges began to make numerous signs, apparently to indicate that they were unarmed, and had no hostile intentions. They stopped at the circle of sledges which surrounded our camp, and one of them, a little man about sixty years old, dressed in a loose wide garment of skin, fearlessly passed the barrier, and told us that he was the Kamakai, or chief of the tribe settled near Tchaun Bay. His quick and decided movements indicated a powerful frame, and the little fiery eyes which glanced from under his short coarse hair, showed resolution and the habit of self-dependence.

After the first greeting "Toroma."* he offered me a piece of seal and some fresh bear's meat. I took him into the tent, and entertained him with the best we had, tobacco, fish, &c. His behaviour was as calm and unembarrassed as if we had been old acquaintance; and with the interpreter's help a long conversation ensued.

He was principally desirous of knowing what had induced us to travel so far at this cold season, how many there were of us, and whether we were armed. We gave him true answers, and endeavoured to explain the object of our journey, and our thoroughly peaceable views and feelings. Our appearance had obviously created uneasiness, and his piercing and restless eyes followed our slightest movements. He answered our questions in return with good-humoured openness. We asked whether his people had seen the cross which we had erected at Cape Chelagskoi in 1820. He said that they had, and had left it untouched, adding, that he himself was the first to discover it, and that he had been the more surprised, as no footsteps or traces of men were visible on the drifted snow. The seal and bear-hunting had been particularly successful that spring, and his tribe had attributed it to the cross, and had sacrificed a young white rein-deer before it.†

He told us that there was no permanent settlement at Cape Chelagskoi, but they usually came there at this season to hunt the white bears,

* The Tchuktche pronunciation of the Russian salutation *Sdorowo*, which they have learnt at the fair of Ostrownoie.

† A cross, which a Russian priest had erected near the Tchaun river, had been pulled down and burnt by the Tchuktches at that place, because they thought that since it had been placed there, the number of fish in the river had diminished.

which they pursue among the hummocks, and kill with spears. In the course of conversation, the old man told us of his own accord, that he was descended from the Chelagi, or as they are usually called by the Tchuktche, the Tchewany, who many years since migrated towards the west, and have not since been seen.

The first of these names has been preserved in that of Cape Chelagskoi, and the second in that of Tchewan or Tchaun bay and river. Our guest took his leave, after a visit of two hours, well pleased with his reception, and with some little presents which I made him at parting.

On the 9th of March the Kamakai repeated his visit, with his wives and children, and a young man whom he introduced as his nephew. As we were drinking tea when they arrived, we offered them some, but on tasting it they all showed signs of great dislike, and took up a handful of snow* from the ground to get rid of the taste; but they were much pleased with the sugar, which we next offered them. It is surprising that the quantity of tobacco which they use both in smoking and chewing, should not have blunted the sensibility of their taste. The nephew was particularly pleased with the sugar, and told us he had eaten some before at Ostrownoie, when he was baptized there. I questioned him further on this subject, but he could tell me nothing, and even referred me to his wife for the name which had been given him. She remembered it, as well as her own, and showed me the small metal crosses which she and her husband had received

* We afterwards saw that it is a common practice with them to eat snow after every meal, even when the weather is very cold.

at the time, according to the custom of the Russian Church, but her knowledge went no further. Whilst our attention was engaged by this inquiry, her little son took advantage of the opportunity to pilfer a knife and some beads, which he hid in his fur shirt. I was unwilling to disturb the general good understanding, and therefore took no notice of the child's theft.

The Kamakai was a very civilized person in his own way. When I had told him the object of our journey, and had apparently succeeded in satisfying him that we had no designs against him and his people, but that we were come to examine the form and situation of their coast, and to learn by what route Russians could best bring them tobacco and other articles for barter, he not only gave me an accurate description of the limits of his country, which extends from the great Baranika to Cape North, but he also drew for us with a piece of burnt wood, the form of Cape Chelagskoi, which he called *Erri*,—Arautan island, which was correctly represented, both as to form and position,—and another island to the east of the Cape, which we afterwards found there. He further assured us positively, that there was no other island along the coast. When I asked him whether there was any other land to the north beyond the visible horizon, he seemed to reflect a little, and then said, that between Cape Erri (Chelagskoi,) and Cape Ir-Kaipii (Cape North,) *there was a part of the coast, where from some cliffs near the mouth of a river, one might in a clear summer's day descry snow-covered mountains at a great distance to the north, but that in winter it was impossible to see so far*. He said that formerly herds of rein-deer sometimes came across the ice of the sea, probably

from thence, but that they had been frightened back by hunters and by wolves; that he had himself once seen a herd returning to the north in this way, in the month of April, and that he had followed them in a sledge drawn by two rein-deer, for a whole day, until the rugged surface of the ice forced him to desist. His opinion was, that these distant mountains were not on an island, but on an extensive land, similar to his own country. He had been told by his father, that a Tchuktche elder had once gone there with a few followers, in large Baidars, or boats, made of skin, but what they found there, or whether they ever returned, he did not know. Still he maintained that the distant northern land was inhabited, and adduced as a proof of it, that some years ago a dead whale had been found at Arautan Island, pierced by spears pointed with slate, and as the Tchuktches do not use such weapons, he supposed that the whale must have been wounded by the inhabitants of the northern land.*

I thanked the old man for his readiness in answering all our questions, and made him a handsome present, promising at the same time, that if his information proved to be well founded, the government would not fail to send him a valuable reward. He wss extremely grateful, and entreated me to get the Emperor to send him an iron kettle, and a sack full of tobacco, which he said would make him thoroughly happy. I assured him that I should use my utmost exertions

* The inhabitants of the Aleutian Islands use spears pointed with slate in killing whales; and as those animals are known to swim great distances in a very short time, it is very possible that the whale found at Arautan Island may have come from thence.

towards his obtaining his wish, and soon afterwards he and his party left us, much pleased with our acquaintance, and with our reception of them.

I availed myself of the fine clear weather to take a meridian altitude, and 22 lunar distances, by which I found the latitude of the isthmus 70° 03′, and its longitude 171° 3′ E. The variation was 18° 3′ E.

On the 10th we continued our journey to the eastward, with a temperature of — 26½°, and a violent W.N.W. wind, which repeatedly caused the sledges to upset. Some of the party were so much delayed by these accidents, that they lost sight of the leading sledges; and the thick-falling snow often making it impossible to distinguish the line of coast, they went astray for a time, and were only warned that they were getting further from the shore by the increasing size of the hummocks.

The coast continues steep and rocky for eighteen wersts to the mouth of a river, where we halted and repaired our sledges. On the 11th the wind fell, and the temperature was — 11° in the morning, and — 24° in the evening. At noon we reached the Kosmin Rock, and by the meridian altitude determined its latitude 70° 01′, its longitude being 171° 55′ by reckoning. The variation was 18° E. From this rock the shore becomes uneven and hilly. We saw several large heaps of whalebones, but very little drift-wood. We crossed over a stream, and halted for the night, twenty-four wersts beyond the Kosmin Rock, at the wide mouth of a river, called by the Tchuktches, Werkon. The two points of land between which it enters the sea, are 11½ geographical miles apart; the eastern shore is low, and

covered with coarse gravelly sand; the western is rocky, and forms a steep promontory, 280 feet high, to which I gave the name of Cape Kyber. Above the rocks rises a conical mountain, called by the Tchuktches, Etschonin. There was a good deal of drift-wood on the sandy beach.

About three and a-half wersts north of Cape Kyber, there is a rocky island of two and a-half wersts circumference, entirely surrounded by hummocks. I subsequently learnt that the Tchuktches call it Amgaoton. I gave it the name of Schalarov, after the man whose enterprise, courage, and perseverance, and finally, whose death in these regions, have well deserved that his name should be so recorded.

Part of the shore of Schalarov Island, is covered with heaps of the bones of whales; these are probably the remains of the dwellings of a people, who lived on seals and fish, and chiefly on whales, of which the bones were employed as timber in building their huts. We were told that their language was very different from that of the wandering rein-deer Tchuktches, and resembled that of the people who live near Behring Straits in mud huts, supported on the inside by whalebones, and having their only entrance from above. They are the same race as the Aleutians and the Greenlanders, which have peopled the coasts, from the eastern part of North America, along the Polar Sea to Cape Chelagskoi.

On the 13th we had a light breeze from the west, a thin mist, and a temperature of $-11°$ in the morning, and $-24°$ in the evening. After taking from the eastern shore of the river as much drift-wood as our sledges could carry, we left the coast, and directed our course over the

ice towards the north. When we had gone four wersts from the shore, we deposited some of our provisions in the ice, with the precautions which have been before described, and sent back the empty sledges to the Kolyma. The ice was not above three feet thick; the depth of water was five fathoms, and the bottom green mud.

On the 14th of March, after going 17 wersts in a N.N.E. direction, over a tolerably even surface, and with a temperature of — 24° and 31°, we came to some very rugged hummocks, where we had to make our way with crow-bars with such labour, that the evening found us completely exhausted, after having accomplished only three wersts more.

On the 15th the cold diminished a little, the temperature being — 13°, and the sky overcast. After toiling the whole day with crow-bars we had only advanced five wersts, and our sledges were so injured that it was necessary to halt to repair them: about the middle of the day we met with a fissure in the ice, of which I availed myself to obtain soundings, and found nineteen fathoms with a bottom of mud and sand.

Being convinced of the impossibility of forcing our way through these rugged hummocks with our heavily-loaded sledges, I determined to send back eight of them, and to deposit here the greater part of our provisions. We excavated two receptacles, and placed in them a supply for twenty-three days, for men and dogs. With the four remaining sledges and five people, M. Kosmin and I proposed to try to advance towards the north. As it was absolutely necessary to carry very little weight, we only took with us provisions for about five days, and a very small quantity of

fuel. Our observed latitude was 70° 12′, and our longitude by reckoning 174° 00′ E.

On the 17th violent wind and snow prevented us from beginning our journey, and increased in the night to a tempest, which broke up the ice in such a manner, that we found ourselves on a detached ice-island, about fifty fathoms in diameter. As the storm continued to rage, we were tossed to and fro, and the fissures on every side of us opened more and more, till some of them were fifteen fathoms across. Thus we passed part of the night, quite aware that we were in considerable danger. At length day broke, and with it came a favourable change of wind, which pressed our fragment of ice against the rest; and by the evening of the 18th we were again in contact and connexion with the firm ice. The depth of water beneath us was nineteen fathoms.

On the 19th the storm had subsided, and the sky cleared, but we saw plainly to the north the dark vapours which rise from open water, and which left us but little hope of the possibility of making any considerable advance in that direction. We did not give up the attempt, however, but used our utmost exertions throughout the day to open a path for ourselves amongst the hummocks; sometimes we had to go a long way round to avoid wide lanes of open water; at others we crossed over the young ice just formed, which could hardly bear us: when evening came, we had only accomplished ten wersts, and were still in sight of the coast.

On the 20th the weather was calm and fine, the northern horizon was dark blue, and the thermometer stood at —11°. The hummocks to the north of us now becoming absolutely and entirely

impassable, we tried to take a W.N.W. direction: but after making about eight wersts we came to an open space, at least five wersts across, and only covered by a thin crust of ice, which from its perfect smoothness, we knew to be just formed. Going round the opening was out of the question, for it extended further than the eye could reach, from W.N.W. to E.S.E. We halted for the night near the margin; the depth of water was 19½ fathoms, the bottom mud and sand.

Our first care on the morning of the 21st was to examine the possibility of further advance; beyond the fissure near which we stood, the hummocks appeared to be of old formation, and less steep and crowded, so that we might hope to find them passable if we could but reach them. This, however, could only be done by trusting to the thin ice of the channel, and opinions were divided as to the possibility of its bearing us. I determined to try, and the adventure succeeded better than could have been hoped for, owing to the incredibly swift running of the dogs, to which, doubtless, we owed our safety. The leading sledge actually broke through in several places, but the dogs, warned, no doubt, of the danger, by their natural instinct, and animated by the incessant cries of encouragement of the driver, flew so rapidly across the yielding ice, that we reached the other side without absolutely sinking through. The other three sledges followed with similar rapidity, each across such part as appeared to them most promising; and we were now all assembled in safety on the north side of the fissure. It was necessary to halt for a time, to allow the dogs to recover a little from their extraordinary exertions.

I availed myself of the unavoidable delay to take a meridian altitude, which gave our latitude 70° 20′; the longitude deduced by angles, from points visible on the main land, was 174° 13′, the variation 21½° E. We profited by the light of a beautiful aurora in the north-east quarter, to continue our march until the night was far advanced, when we had accomplished twenty-four wersts since noon among old hummocks and loose snow, which afforded comparatively easy travelling.

The morning of the 22nd was fine, but towards noon a gale sprung up from the west, and we had thick drifting snow, which often placed us in great danger, by concealing from us open places, till the foremost dogs of a team had fallen into the water, when they usually narrowly missed dragging the sledges after them: after advancing with caution for twenty-four wersts N. by E., I sounded, and found twenty-one fathoms water, with clay and fine sand. We went ten wersts further, and slept among a group of hummocks surrounded by fissures. During the night the wind rose again, and widened the openings in the ice: fortunately it subsided before morning, and we were able to get out of our island by forming a kind of bridge of loose fragments of ice.

Besides the serious difficulties presented by the state of the ice, the provisions for our dogs were beginning to fail. To make them hold out as long as possible, I sent back two sledges to the last deposit, and divided their share among the two which I still retained, and with which we resumed our route to the north, more for the satisfaction of knowing that we had left nothing undone that was in our power to do, than with any hope of a favourable result. Till noon, on

the 23rd of March, we had clear weather, with a light breeze, which, towards the afternoon became fresh, with gathering clouds; while from north-west to north-east, the horizon was covered by the dense blue vapour, which, in these regions, always indicates open water. Notwithstanding this sure token of the impossibility of proceeding much further, we continued to go due north for about nine wersts, when we arrived at the edge of an immense break in the ice, extending east and west further than the eye could reach, and which at the narrowest part, was more than 150 fathoms across. The sharp westerly wind was widening the gap, and the easterly current was running at the rate of a knot and a-half. We climbed one of the loftiest ice-hills, when we obtained an extensive view towards the north, and whence we beheld the wide immeasurable ocean spread before our gaze. It was a fearful and magnificent, but to us a melancholy spectacle! Fragments of ice of enormous size floated on the surface of the agitated ocean, and were thrown by the waves with awful violence against the edge of the ice-field on the further side of the channel before us. The collisions were so tremendous, that large masses were every instant broken away, and it was evident that the portion of ice which still divided the channel from the open ocean, would soon be completely destroyed. Had we attempted to have ferried ourselves across upon one of the floating pieces of ice, we should not have found firm footing upon our arrival. Even on our own side fresh lanes of water were continually forming, and extending in every direction in the field of ice behind us. We could go no further.

With a painful feeling of the impossibility of

overcoming the obstacles which nature opposed to us, our last hope vanished of discovering the land, which we yet believed to exist. We saw ourselves compelled to renounce the object for which we had striven through three years of hardships, toil, and danger. We had done what duty and honour demanded; further attempts would have been absolutely hopeless, and I decided to return.

According to my reckoning, the point from which we were forced to return, is situated in 70° 51′, and 175° 27′. Our distance from the main-land, in a direct line, was 105 wersts. We had 22½ fathoms water, with a clay bottom.

We proceeded rapidly along our old track, towards the coast, and, though impeded by several fresh openings, formed during our short absence we made good thirty-five wersts, before halting for the night in a group of old hummocks.

On the 24th, we set off early, with a moderate breeze from the west, and a temperature of — 8°. We had every reason to hasten, for our old track, which we tried to follow as much as possible, was frequently interrupted by fresh hummocks, piled up since the day before, a proof of the very dangerous state of the ice. We had to ferry ourselves across many fresh breaks, on pieces of ice which were sometimes too small to hold a sledge with its team of dogs. In such cases, we made the dogs swim, and help to tow us across, but the strong current which generally prevailed in the lanes of open water, rendered this a matter of difficulty. Not far from our last deposit of provisions, the current set E.S.E., with a velocity of four miles an hour; the temperature of the sea at this place was + 28°, while that of the air was + 9⅓°. At night, we reached our deposit, and

found the two sledges which we had sent back, and the provisions, safe.

On the 29th, we had a gentle breeze from the east; a thick mist concealed from us the coast of the continent. In the morning the temperature was $-2°$, and in the evening $+10°$. The strong current ceased with the change of wind, and many of the fissures in the ice closed again. Still our position on this frail and broken-up surface, which the first sea-wind would cause to separate again, was too serious to admit of my allowing the exhausted condition of the dogs to detain us a moment from attempting to gain the coast with our provisions. Whilst we were preparing to start, our best sledge-driver was suddenly taken with such violent pains in the back, that he could not raise himself up; this obliged us to remain for the day, and to try what our few means, which were merely rest, and rubbing with spirits and oil, could do for him. I may take this occasion to give to our drivers the praise which is so justly their due, of having shown unwearied courage, patience, and cheerfulness, in the greatest perils and toils, as well as in every privation. Whilst thus reluctantly detained, two stone-foxes were discovered in our neighbourhood, and perilous as was our situation, the innate love of the chase so far prevailed, that the three other drivers, instead of taking the opportunity of rest, occupied themselves in constructing a couple of very ingenious traps, baited with a portion of their own scanty rations, in which they succeeded in taking one of the foxes; the other was found at a short distance, having died of hunger.

The severe cold was daily decreasing. On the 26th of March, with a mild S.S.E. breeze, we had,

in the morning, a temperature of + 27°, and in the evening of + 14°. Our patient was better for the twenty-four hours' rest which we had allowed him, but was still quite unable to drive. Every hour increased the danger of remaining where we were, and M. Kosmin, always ready to do the utmost in his power, undertook to drive the sledge, putting the sick man into his own place. We could not, by any contrivance, manage to carry all our provisions with us, and we had only to hope that we might be able to fetch away such part as we were obliged to leave. After driving only three wersts, we found our old track completely obliterated by fresh hummocks and fissures, which rendered our advance so difficult that we were at last forced to abandon a part of the stores which we carried. After toiling on for two wersts more, we found ourselves completely surrounded by lanes of water, opening more and more, until, to the west, the sea appeared completely open with floating ice, and dark vapours ascending from it obscured the whole horizon. To the south we still saw what appeared a plain of ice, but it consisted only of larger fragments, and even these we could not reach, as we were separated from them by a wide space of water. Thus cut off on every side, we awaited the night with anxiety; happily for us, both the sea and the air were calm, and this circumstance, and the expectation of a night-frost, gave us hope. During the night a gentle breeze sprung up from the W.N.W., and gradually impelled the ice-island on which we were, towards the east, and nearer to the larger surface before-mentioned. In order to get over the remaining space, we hooked with poles the smaller pieces of ice which floated about, and

formed with them a kind of bridge, which the night-frost cemented sufficiently to admit of our crossing over upon it before sun-rise on the 27th. We had hardly proceeded one werst, when we found ourselves in a fresh labyrinth of lanes of water, which hemmed us in on every side. As all the floating pieces around us were smaller than the one on which we stood, which was seventy-five fathoms across, and as we saw many certain indications of an approaching storm, I thought it better to remain on the larger mass, which offered us somewhat more security; and thus we waited quietly whatever Providence should decree. Dark clouds now rose from the west, and the whole atmosphere became filled with a damp vapour. A strong breeze suddenly sprung up from the west, and increased in less than half an hour to a storm. Every moment huge masses of ice around us were dashed against each other, and broken into a thousand fragments. Our little party remained fast on our ice-island, which was tossed to and fro by the waves; we gazed in most painful inactivity on the wild conflict of the elements, expecting every moment to be swallowed up. We had been three long hours in this position, and still the mass of ice beneath us held together, when suddenly it was caught by the storm, and hurled against a large field of ice; the crash was terrific, and the mass beneath us was shattered into fragments. At that dreadful moment, when escape seemed impossible, the impulse of self-preservation implanted in every living being saved us. Instinctively we all sprang at once on the sledges, and urged the dogs to their full speed; they flew across the yielding fragments to the field on which we had been stranded, and safely reached a part

of it of firmer character, on which were several hummocks, and where the dogs immediately ceased running, conscious, apparently, that the danger was past. We were saved; we joyfully embraced each other, and united in thanks to God for our preservation from such imminent peril.

But the continued raging of the tempest, and the crashing of the ice around, warned us not to delay, and, after a few moments' repose, we hastened onwards, guided by our view of the coast, to our first deposit of provisions, four wersts from the shore. There we loaded our sledges with as much as they could carry, and before it was perfectly dark reached the land.

We passed the night near the mouth of the Werkon, where an overhanging cliff afforded some protection from the storm, and enabled us to light a fire, and to refresh ourselves with food and tea, of which we stood greatly in need.

On the 28th, the storm subsided, we had a moderate breeze from the E.N.E, the sky was clear, and the air mild; in the morning the temperature was + 9°, and in the evening + 3°. We spent the day in bringing away the stores that still remained near the coast, and the calmer state of the atmosphere gave us hopes that a steady frost might yet enable us to recover the provisions, which had been left in our more northern deposit, supposing it still to exist. Such an increase of our means would have been very important to us in our journey to the eastward, as we could not depend much on receiving assistance from the Tchuktches.

On the 29th I allowed the exhausted dogs to rest. The weather was clear, and the tempera-

ture from — 8° to — 11°. By the meridian altitude I found the latitude of the north point on the east side of the Werkon river, 69° 51′, its longitude by reckoning being 173° 34′. The variation was 18° 56′ E.

As the cold continued, and on the 30th of March increased to —15°, I thought it not improbable that an attempt to reach our deposit in the ice might be successful. M. Kosmin started with three empty sledges, but returned at the end of six hours, having been stopped by wide open places which had not been frozen over. During his absence I surveyed the eastern bank of the mouth of the Werkon, which consists of a group of rounded hills, on which are many pillars or columns, similar to those on the Baranov Rocks; these are called by the people of the country, Kekury. The hills terminate in a low point of land projecting some way into the sea, forming the eastern point of the mouth of the river. I gave to the whole promontory the name of Cape Kekurnoi, from the above mentioned Kekury or columns. It bears from Cape Kyber S. 80° E., distant thirty wersts. The coast between them consists of low flat islands separated from each other by the several arms into which the river divides; the principal arm is on the east side, and is half a werst across. The observed latitude of Cape Kekurnoi is 69° 51′, and its longitude 174° 34′.

A heavy fall of snow, and a strong E.N.E. wind with a temperature of + 5°, induced me to remain during the 1st of April. On the 2nd we took our departure towards the east, and were in hopes of meeting with M. von Matiuschkin, to whom I had intrusted the survey of the coast; as unhap-

pily there was now nothing more to be done to the north, I wished to reunite our two parties and to complete the survey together; in case he should arrive at this place after we had left it, I had a signal erected on one of the most conspicuous hills, with a notice that we were in great want of provisions, and required his assistance as soon as possible. In fact the loss of our provisions had placed us in such a position that all our hopes rested on effecting a junction with the other division.

We slept on the 3rd twenty-three wersts from Cape Kekurnoi, not far from the remains of a balagan, built of drift-wood, which appeared to have been erected by Russians, and to have been long unvisited. In the night we had a strong west wind, which continued during the 4th, and favoured our course so much, that with the additional advantage of our dogs being animated by numerous fresh rein-deer tracks, we went forty wersts in less than five hours, across a level tundra, hardly distinguishable to the eye from the surface of the sea.

As our provisions were very low, and I was nevertheless anxious to continue the survey, I sent M. Kosmin in an empty sledge on the sea-ice, to try to kill a bear as food for our dogs, of which we were especially in want. He returned at the end of ten hours, without success; after going twenty wersts to the north, he had been stopped by a wide fissure, and having climbed a large hummock, saw from its summit much open water from W.S.W. to N.; to the N. and N.E. the open spaces were a little less numerous, but the ice was crowded with lofty, and apparently impassable, hummocks: from N.E. to E. he saw

no open water, but the distant horizon was dark-blue. There were no tracks of bears, but many of stone-foxes, all directed to the N.E. This account made it clear that we were effectually cut off from the spot where we had deposited our provisions, and that in all probability they must have been carried away. We could have no hope, therefore, on that ground; we were at least 360 wersts from our nearest magazine at the mouth of the Baranika; and the provision for our dogs was barely sufficient for three days. There was nothing to be done but to begin our return, which we did on the 6th of April, with the prospect of our dogs perishing by the way for want of food, and our having to travel the remainder of the distance on foot.

We had gone about ten wersts in a westerly direction, when we were agreeably surprised by the appearance of M. von Matiuschkin and his party. They were in perfect order, in excellent health and spirits, and abundantly supplied with provisions of all kinds. It may well be supposed that our joy at meeting was great on every account.

Whilst engaged in surveying the coast, and making short days' journeys, M. von Matiuschkin had had repeated opportunities of meeting with the Tchuktches. They had always shown some distrust at first, but had afterwards become friendly. At Cape Chelagskoi he had found a party, whose chief, or Kamakai, happening to be an old acquaintance of the interpreter's, soon became on easy terms, and was very communicative. He said, that in the tundra east of the Werkon river, there were remains of a house, which his father had told him was built by Russians, who

had escaped from the wreck of a large vessel, and had afterwards perished there: he added, that when a party of roving Tchuktches came upon the huts several years ago, they found human bones, apparently gnawed by wolves, some remains of stores and tobacco, and some large white sails; and that at a little distance from the house, there was a forge, and a number of iron articles. This account induced M. von Matiuschkin to go some way round, to visit the spot described, where he actually found the remains of a large hut formed of well-hewn boards carefully put together, which evidently could not have been constructed, either by Tchuktches, or by passing travellers as a temporary shelter, but must have been the work of persons who remained some time. All these circumstances, taken in connection with the locality, and the period assigned by the Kamakai, scarcely leave a doubt that this is the spot where Schalarov perished. No other navigator visited this part of the Polar Sea at that epoch; and it is more than probable, that after doubling Cape Chelagskoi for the second time, he was stranded on this desert coast, and here terminated his active and enterprising life. Schalarov's name is known throughout Siberia, and the cordial sympathy, which even our half-civilized companions expressed at the sight of these remains, was a touching tribute to the memory of this remarkable man.

Dr. Kyber had been acquainted at Ostrownoie with some of the chiefs of the Tchuktche tribes of this coast, who had spoken much of a more northern land, the lofty mountains of which were visible on very clear days, from a place which they called Jakan, and which they described

tolerably circumstantially. From the description, it appeared that Jakan lay to the eastward of our present position, and I determined to visit it. Before we started, I took a review of all the provisions belonging to both divisions, had part of them buried in the ice, and sent six sledges back to Nijnei Kolymsk, in order to husband the provisions for our dogs as much as possible. Of the seven remaining sledges, three were assigned to M. von Matiuschkin's division, and four to my own,

On the 7th of April the weather was warm; we had a gentle S.S.E. breeze; at eight in the morning the temperature was + 32°, and at noon it rose to 38½°. I had arranged to rest during the day, and travel during the night, when the twilight was sufficiently bright, and when there was usually some frost to facilitate the draft; but the night between the 7th and 8th was so warm, that we were obliged to remain at the spot where we had slept on the 5th. We availed ourselves of this detention to take several observations. I found the latitude of the place by the noon observation 69° 48′, and the longitude by lunars 176° 10′, which gave a fresh point of departure. A rock twelve wersts from hence seems to form the boundary between the flat tundra and the hilly ground, which begins about fifteen wersts east of Cape Kekurnoi. The ground near the mouth of the Auguon river, which falls into the sea twenty-three geographical miles east from Cape Kekurnoi, is low, and we saw many reindeer there.

On the 8th the weather was clear, and the temperature + 25° in the morning and evening, and + 36° at noon. After following the coast, which

was sixty feet high, for seven wersts, we came to a rock projecting some way into the sea, behind which the shore suddenly becomes low and flat, consisting of gravel, and weathered fragments of rock. The place corresponded perfectly in these and other respects, with the description which the chiefs had given to Dr. Kyber of Cape Jakan. I determined its latitude 69° 42′; and its longitude is 176° 32′ by reckoning, dependent on our observation the day before. We gazed long and earnestly on the horizon, in hopes, as the atmosphere was clear, of discerning some appearance of the northern land, which the Tchuktches affirm they have seen from this place, but we could see nothing of it. We continued our route towards the east, and after going four and a half wersts from the rock, we came to the mouth of a small river called Jakan Uwaian. We saw near it, on the strand, the framework of a baidar, twenty-one feet in length, which satisfied us completely, that the rock we had passed was truly Cape Jakan; for not only the chiefs at Ostrownoie, but also other Tchuktches whom we subsequently met near Cape North, told us of this vessel as a mark whereby to recognise the Cape. They said that they had covered it with walrus-skins, and used it when the state of the ice permitted, for taking walruses, which are very abundant about Cape Jakan. It is remarkable, that from this Cape to the Indigirka, hardly any walruses are seen, whereas from the Jakan to Tchukotski Noss, both these animals and whales are abundant.

When we had gone sixteen wersts eastward from the Jakan river, the warmth of the weather obliged us to halt. The noon observation gave

the latitude 69° 36′, the longitude by reckoning being 176° 58′. The coast was low and flat; Cape Jakan bore by compass N. 83° W.; the variation was 21½° E. At many places along this coast we saw the bones of whales stuck upright in the ground; our interpreter, and subsequently the Tchuktches whom we met, said that they were the remains of the former dwellings of a stationary tribe. They appeared to have been habitations of a better and more solid kind than are now used, and to have been partly sunk in the ground. As soon as it became a little cooler we resumed our march, and after ten wersts came to a range of cliffs, which we followed for twenty-five wersts further, when we found a gravelly flat with occasional earthy hills. We were soon after gratified by finding a quantity of drift-wood, consisting chiefly of fir and pine, with very little larch. We had for some time past only allowed ourselves fuel for cooking or boiling water once a day, and we now took a sufficient supply. To M. von Matiuschkin this was the more important, as he intended to make one more attempt over the sea-ice, in hopes of getting sight of the land spoken of by the Tchuktches. We were now by reckoning in 69° 28′ latitude, and 177° 44′ longitude.

On the 9th the sky became overcast, we had a strong west wind and drifting snow, with a much lower temperature. In the morning it was + 18°, at noon + 12°, and in the evening + 7°. M. von Matiuschkin hastened to avail himself of this favourable circumstance, and started on the ice towards the north, with three sledges, and provisions for fifteen days. M. Kosmin, Dr. Kyber, and I proceeded eastward with four sledges, and provisions for thirteen days. A mist covered the

country, so that we could not discover its aspect. After travelling forty-eight wersts we came to the mouth of the little River Kujetchun, and halted thirteen wersts further on at five in the morning on the 10th of April. The coast was low, and we saw many piles of drift-wood; this, and the tracks of rein-deer sledges gave us hopes of meeting and becoming better acquainted with the natives. Our halting-place was by reckoning in 69° 12′ latitude, and 179° 13′ longitude.

At day-break we had a moderate breeze from the east, but during the day it increased, and brought drifting snow. In the morning the temperature was + 4°, and in the evening + 3°.

We followed the coast, which makes a considerable bend to the S.E. from our halting place, and after going twenty-three wersts we came to a cliff which runs far out to sea, and being only connected with the shore by a low isthmus, looks at the distance of fourteen wersts like a small detached island. As we approached it early in the morning of the 11th, we saw with pleasure several Tchuktches and their huts on the isthmus.

This is, without doubt, the point which Captain Cook saw in 1777, and to which he gave the name of Cape North. The two hills connected by a low isthmus running from east to west, the sea to the south, and every other circumstance agreed perfectly with his description, and the latitude which we afterwards observed completed our conviction.* This Cape, which bears, in some respects, a great resemblance to Cape Chelagskoi, consists of a slate rock 105 feet high,

* An old Tchuktche told us, that many years ago, he had seen two fine large ships. If this were true, they were probably Captain Cook's vessels.

with a ridge still higher, joining it to another cliff to the east; the whole is connected with the continent by the low isthmus mentioned above. Captain Cook considered the sea which he saw beyond the tongue of land to be a bay, or the mouth of a large river.

As soon as we came in sight of the Tchuktches, we slackened our pace, and halted on the ice at the distance of a werst and a half, in order to avoid causing alarm by a sudden approach. In spite of this precaution, our very unexpected appearance seemed to produce considerable commotion; we observed them running to and fro, and gathering in groups, apparently in earnest consultation. Two men then detached themselves from the rest, and approached us at a slow pace: I sent the interpreter to meet them, and to explain our views and pacific intentions. When he came up to them, they saluted him gravely, and sat down without speaking. The interpreter then filled their pipes, still without a word being spoken; and it was not until these had been smoked out, that he began his discourse. It lasted a long time, and seemed to make a favourable impression, for the two men stood up, and allowed themselves to be conducted to our sledges.

When they arrived, one of them said that he was Etel, the chief of the tribe; and in token of good-will, offered me two freshly caught seals. He added that he was perfectly satisfied of our peaceable intentions, and was ready to give us any assistance in his power towards the execution of our undertaking. In the course of conversation we learnt that he was related to our friend the Kamakai at Cape Chelagskoi, and the news which we were able to give of his kinsman contributed

not a little to confirm a good understanding between us. I presented him with tobacco and other things, and at parting, he repeatedly invited me to return his visit, which I did next day, (12th of April).

He received us in a large tent of rein-deer skin, surrounded by his various treasures, which were arranged with some degree of elegance. There were a number of stone-fox skins, wide thongs of walrus-skin, a quantity of whale-bones, some small rein-deer sledges remarkably neatly made, leathern cuirasses, javelins, bows and arrows, and a variety of implements for fishing, seal-hunting, &c. "There," said he, "look well at all those things, take from them what you like, and give me in return a gun, and powder, and shot, I am very fond of hunting, and I am sure I could use a gun better than the Mountain Tchuktches, amongst whom I once saw one, and shot with it."

He continued to urge this request, and at last I promised to grant it, if he would procure for us thirteen seals for our dogs; fetch for us, on his sledges, a supply of firewood, from twenty wersts off; and accompany us to Koliutchin Island, where he had told me that he had a married sister living. He probably expected to have been asked a great deal more, for, without a moment's deliberation, he agreed to all my proposals, praised my moderation and liberality exceedingly, and immediately gave the necessary orders respecting the drift-wood and the seals. Our departure was arranged for next day; I thought that having the chief of the tribe with me, I might venture to leave the greater part of our stores in his hut until our return, which lightened our load very much. As I was going away, Etel stopt me with

a request, that he might take with him a batas,* intended as a present for his sister. I could easily perceive that he was thinking less of his sister than of being thus armed with the peculiar weapon of the Tchuktches, but I made no objection, and we parted excellent friends.

Etel made his appearance early next morning (13th of April), fully equipped for the journey. He appeared to have put on his best clothes, and carried on his back a kind of havre-sack, with tobacco, and some few other European trifles, intended for barter at Koliutchin. His cap was much ornamented with beads, and ear-rings, and surmounted by a large raven's head, which he told us would ensure us a fortunate journey, and a good reception.

We set off, and were accompanied, for some distance, by the greater part of the inhabitants of the village, who were evidently under some anxiety respecting their chief; at length they took their leave, with many ceremonies, and repeated entreaties that Etel might come back very soon.

Late in the evening we arrived at two single Tchuktche huts, where Etel advised us to pass the night. The inhabitants were roused from their sleep by the barking of the dogs, and being frightened at the sight of so many strangers, caught up a large Shaman drum, and made a hideous din, till their friend Etel came forward with his raven's head, and by this significant emblem, and his assurances of our peaceful intentions, induced them to be quiet. There were only four men and five women, they seemed very poor, and could only spare us one seal.

* A kind of straight sword or large broad knife, fastened to a long handle.

This place is ninety wersts from Cape Ir-Kaipie (or Cape North); the coast between is low and flat. About forty wersts from the promontory there is a river called Ekechta, narrow, rapid, and very full of fish. We passed also three inconsiderable streams which fall into the same bay. Drift-wood is scarce along this coast, partly from the consumption by the numerous parties of Tchuktches, and partly from natural causes; the rivers of this district, coming from a country producing no other trees than a few willows, bring no wood, and the ice opposes, in great measure, a barrier to its arrival by sea. The greater part of the drift-wood found between the Chelagskoi and Tchukotsky Noss is, however, probably of American origin, for it consists chiefly of stems of pines and firs, which do not grow along any of the rivers which enter the sea between the mouth of the Indigirka and Tchaun Bay. Trunks of those trees are brought down in abundance by the Lena, but they are not often drifted as far as the Indigirka, and are rarely seen among the quantity of larch, aspen, and poplars which are floated down by the other rivers of northern Siberia. My opinion, that the drift-wood on this part of the coast comes from America, is confirmed by the assertion of the Tchuktches, that among the trunks of fir they not unfrequently find some which have been felled or hewn with stone axes.

On the 14th of April we continued our journey along the sandy shore, and after proceeding twelve wersts we came to the Amguema river, which is two and a-half wersts broad at its mouth. Etel told us that the rein-deer formerly crossed the river in their annual migrations, and that the Tchuktches were in the habit of resorting here from Koliutchin Island on that account, but that the rein-

deer had ceased to pass this way. Fourteen wersts from the river the sandy shore is replaced by a steep bank of moderate elevation, and the plain rises gradually to the foot of a chain of mountains, running parallel with the coast, at a distance of from twenty to thirty-five wersts. At the point where the steep coast begins, I found the latitude, by observation, 68° 10′, and the longitude, by reckoning, 182° 6′.

Our progress was so rapid that we accomplished eighty-four wersts in the course of the day, and passed the night at a Tchuktche settlement on the west side of the Wankarem river, and close to a cape of the same name. Our dogs were too much knocked up to bark; so that the inhabitants were not roused by our approach. Before Etel woke them, he went to a spot not far from the huts, where he had previously told us that some of his ancestors were buried, and repeated, with much earnestness, a short prayer, and offered some leaves of tobacco to the manes of the buried. When this was completed, he entered one of the huts, and, I suppose, gave his countrymen a favourable report, as the head-man of the village came out to welcome us, and we obtained from him several seals for our dogs, for which we made him a handsome present. There is a remarkable similarity between the three promontories of Chelagskoi, Ir-Kaipie, and Wankarem; all are of fine-grained sienite, with greenish-white feld-spar, dark-green hornblende and mica, and are united to the main-land by a narrow isthmus: the height of the cape and the breadth of the isthmus are greatest at Cape Chelagskoi, and least at Cape Wankarem.

On the 15th we started at day-break, the sky

was clear, the horizon to the north dark-blue, the air mild, and the temperature + 7° in the morning, and + 5° in the evening. On crossing the isthmus of Wankarem, we saw towards the east, five wersts from the cape, a small island about two wersts in circumference. High rocks of granitic porphyry begin to appear twenty-five wersts S.E. of Cape Wankarem. By a meridian altitude, which I obtained sixteen wersts from our halting-place, I found the latitude of this point 67° 43′, the longitude, by reckoning, being 183° 34′ E., and the variation 23° E. Cape Onman was distant ten wersts; it is distinguished by a high mountain and a detached range of columns at a short distance from the cape, 140 feet in height, and resembling the ruins of colossal buildings. Among the masses of rock on the beach, at the foot of these remarkable rocks, were a few Tchuktche huts.

As soon as we had rounded Cape Onman we saw, on the horizon, Koliutchin Island, appearing like a round mountain, distant thirty-three wersts. We found a well-beaten track leading to it, over which we advanced rapidly. After passing Cape Onman, the coast trends away sharply to the southward, and this cape may be considered to form the western point of Koliutchin Bay, the eastern side of which we could not distinguish on account of the fog. The shore of Koliutchin Island, (Burney Island of Cook,) consists everywhere of steep rocks of reddish granite; it is about three and a-half wersts across. The Tchuktche village, which we proposed to visit, is situated on the southern point, which does not rise much above the level of the sea. When we were within a quarter of a werst of the huts we halted on the

ice. As soon as the Tchuktches had perceived us the whole place was in commotion; the women and children were sent away to a hill behind, and the men, armed with spears, batasses, and bows, arranged themselves in fighting order to await our approach. Etel asked us to let him go forward alone to speak to his countrymen; he did so, and in a very short time they were so well satisfied that they laid aside their arms, and we were soon on a friendly footing. They were very much pleased at my proposal to barter beads and tobacco for whales' flesh for the dogs; they had plenty to spare, having killed last summer no less than fifty whales, besides walruses. Our good understanding with the islanders was soon made known to the Tchuktche settlers along the neighbouring coast, and they flocked in, bringing on their sledges whales'-flesh, walrus-skin thongs, and wood, which they hoped to exchange for tobacco. Above seventy men collected in a short time, and the ice round our little camp soon resembled a busy fair. Every new arrival expected a present of tobacco before we should begin to trade: the wealthier people sat in their sledges, drawn by four or five dogs harnessed abreast, and driven by a man of inferior condition who ran by the side. Most of them called themselves chiefs, and as every one expected a larger present than his neighbours, our little store of tobacco was soon exhausted.

Among the strangers was a chief from Behring Straits, whose dress was adorned with many unusual decorations; he had round his neck some little metal images of saints, and two writings secured between bits of wood, to which he attached great importance. One of these writings

was to say that he and his three sons had been baptized, and the other, that he had sent the emperor a fine black fox-skin, and had received in return an upper garment (kamleia) of red cloth, as a mark of the imperial regard. He was a most tiresome boaster, and seemed to consider himself entitled to make the most impudent demands, without offering anything in return or doing us the slightest service. With this exception we were tolerably well satisfied with the behaviour of the people towards us, though in spite of all our care a good many things were stolen; nor does it appear that they confine the exercise of this disposition to their dealings with foreigners, for our friend Etel asked us to take charge of his property for him, as he did not trust altogether to his countrymen of Koliutchin.

The fatigue of our dogs made it necessary to remain two days at this island; their condition after the great exertions and exposure to which they had been subjected in the ice, the want of tobacco for purchasing a fresh supply of provisions, and the advanced state of the season, obliged me to think of returning to Nijnei Kolymsk, from which we were 1060 wersts distant, and to relinquish the hope which I had entertained of surveying the Asiatic coast the whole way to Behring Straits. Though, however, I could not accomplish so much, I had the satisfaction of knowing that geography would not lose anything of importance, as my survey was met at this place by that which Captain Billings's expedition had made of the coast, from the Straits to Koliutchin Bay. We took our departure on the evening of the 17th; up to the last moment fresh people continued to arrive and to torment

us for presents, and we were even followed by them for some distance.

The south point of Koliutchin island is in 67° 27′ latitude by meridian altitudes, and in longitude 184° 24′ E. by reckoning. Variation 23° 26′ E. We could not make any observations of dip, as the instrument had been so much injured, as to be quite unserviceable.

Early on the morning of the 20th we reached the village of Ir-Kaipie; the inhabitants were overjoyed at the safe and prosperous return of their chief, and gave us back the things we had left. They had besides procured for us the seals which I had asked for, which took two days to prepare for travelling. I had hoped to avail myself of this delay, to obtain a more exact astronomical determination of the position of the Cape by lunar distances; but unfortunately the weather was overcast, and I had to be contented with the latitude determined by four altitudes of the sun, taken with both our sextants: the result gave Cape North or Ir-Kaipie in 68° 55′ 16″. The longitude dependent on that of Cape Jakan, which had been astronomically determined, is 179° 57′ E.* Variation 21° 40′ E. On the 22nd of April we commenced our return along the coast to the westward.

Before I proceed with the account of our return, I will give here the principal particulars which I collected during our short stay among this people hitherto so little known.

The Tchuktches inhabit the north-eastern part of Asia, extending from Tchaun Bay to Behring

* Captain Cook determined the latitude of Cape North, or Ir-Kaipie 68° 56′, and its longitude 180° 49′ E. from Greenwich, by the ship's reckoning.

Straits in one direction, and in the other from the Anadyr, and the upper country of the Aniui, to the Polar Sea. Their neighbours to the south are the Koraks, and to the west the Tchuwanzes and Iukahirs of the Aniui. They formerly occupied a more extensive territory, before the Cossacks from the Lena subdued the country through which the Kolyma flows. This is proved by the names of the Greater and Lesser Tchukotski rivers, and by numerous traditionary stories respecting their conflicts with the first Russian settlers on the western banks of the Kolyma. Pogromnoie and Ubennoie Pole, (the Valley of Desolation, and the Valley of Death,) derive their names from these encounters. The Tchuktches, though still in great measure a nomade race, have less of the characteristics which usually accompany such a mode of life than the wandering Tunguses; they are more covetous and more saving than belongs to the character of genuine nomade races. They lay up stores for the future, and in general do not remove their dwellings without an object, but only when it becomes necessary to seek fresh pasture for their rein-deer. They are disgraced by the most shameless licentiousness, while the manners of the Tunguses are comparatively pure. The Tchuktches also appeared to us far from possessing the cheerfulness of the Tunguses, whose constant liveliness and gaiety had been a frequent subject of remark amongst us. Their dress differs greatly from that of the Tunguses, which is tight and close-fitting, and well adapted to an active wandering life, whereas, the clothing of the Tchuktches is large, loose, and cumbrous. They wear long wide trousers made of fur, and an ample Kuchlanka.

The coast of the Bay of Anadyr is inhabited by a people very distinct from Tchuktches in figure, countenance, clothing, and language, called Onkilon (sea-people). Captain Billings in the description of his journey through the Tchuktche land shows, that the language of this coast people has a close affinity to that of the Aleutians of Kodiak, who are of the same stock as the Greenlanders (Esquimaux). There are traditions which relate that two centuries ago the Onkilon occupied the whole of the coast from Cape Chelagskoi to Behring Straits; and it is true that there are every where along this tract the remains of huts constructed of earth and whalebones, and quite different from the present dwellings of the Tchuktches. A disagreement between Krächoi, the principal chief of the Asiatic Esquimaux, and an Errim, or head of a tribe of rein-deer Tchuktches, broke out into decided hostilities; Krächoi was defeated and forced to flee, his people migrated, and the coast was deserted. The inhabitants of Ir-Kaipie relate, that Krächoi, having killed a Tchuktche Errim, was closely pursued by the son, and after some time retreated to the rock of Cape North, where he intrenched himself behind a kind of natural rampart which still exists. The young Errim followed him thither, and succeeded in killing Krächoi's son, by which, according to the ideas of these people, the debt of blood was paid. Krächoi let himself down from the cliff during the night by means of thongs, and got into a boat which was waiting for him at the foot of the rock. He at first steered towards the east to mislead his pursuers, but the following night he turned westward, and reached Schalarov Island, where he built the earthen huts of which we had seen the remains. He was gradually

joined by his kinsmen, and others of his own tribe; and they all finally fled together in fifteen baidars to the country, of which the mountains are said to be sometimes visible from Cape Jakan. In the course of the winter, a Tchuktche who was allied to Krächoi, disappeared with his family and rein-deer; and it was supposed that he too had gone to the northern island.

Formerly all the Tchuktches lived on the produce of their rein-deer; but those among them who lost their herds by sickness or other causes, settled by degrees along the coast, where they kill whales, seals, and walrusses. These animals, the whales especially, are particularly abundant about Koliutchin; they become more rare in going westward, and are not met with at all west of Cape Chelagskoi. This is, no doubt, the reason why we found the population along the sea-coast increase as we approached Behring Straits. The people of the country are now divided into two classes, the settled Tchuktches who live on the coast, and the rein-deer or nomade Tchuktches who inhabit the mountainous parts of the country. The latter, who form the chief bulk of the population, call themselves Tennygik. The two classes live on good terms with each other, and interchange their different commodities. The inhabitants of the coast furnish to the nomades, whales' flesh and bones, walrus-skin, and train-oil, which is a favourite article of food; and receive in return rein-deer skins, both raw and made up into clothing.

The huts of the settlers are clustered in little villages along the shore. They are formed of poles, or of bones covered over with skin, and coming to a point at the top, where there is a hole for the smoke to escape. The low entrance is

always turned to the south, and is at the narrow end of the hut: the opposite end which is bowed is much broader, and in it is a low square inner tent which forms the sleeping and living apartment. In severe cold weather it is also used for cooking in, by the heat of a lamp of train-oil with moss wicks. The usual cooking fire is made of bones which have been soaked in train-oil; drift-wood for fuel being extremely scarce.

At Ir-Kaipie, the principal occupations are taking seals and walruses. Seals are sometimes caught by a sort of net formed of thongs, which is placed under the ice, and in which the animal becomes entangled. Sometimes the following method is used: the hunter dresses himself in white, that he may not be noticed on the snow, and lies down near one of the openings by which the seals come out of the water to sun themselves: he is armed with a lance, and carries an instrument made of five bears' claws fastened to a stick. With this he keeps gently scratching the snow or the surface of the ice the whole time; the people say that this sets the seals to sleep, but its more probable use is to cover the noise made by the hunter as he gradually creeps nearer, till he is able to reach the animal with his lance. This method rarely fails of success. Wolves are killed by a very ingenious device. The two ends of a strong piece of whalebone are bent together, and fastened by a thread; water is then poured over the ring till it is covered with a crust of ice sufficiently strong to make it retain its form; the thread is then cut away, and the whole is smeared over with fat. The wolf on finding it swallows it greedily, when the ice melts and the elastic whalebone springs asunder and chokes him. Walruses are taken by cutting off their retreat to the water,

when they are despatched with ease. The walrus is almost as useful to the settled, as the rein-deer is to the nomade, Tchuktches. The flesh and the blubber are both used for food, the latter for the lamps; the skin is made into durable thongs for harness and other purposes, and into strong soles for boots; the intestines furnish a material for light water-proof upper garments for summer use; a very durable thread is prepared from the sinews; and lastly, the tusks, which are of the finest ivory, are sometimes formed into long narrow drinking-vessels which it takes a long time to hollow out, but are more frequently sold to the rein-deer Tchuktches, who convey them to the Russians. The most dangerous chase is that of the white bears, which the hunters pursue to their dens among the hummocks, and which are killed with spears, frequently after a severe combat. For fishing they use baskets of thin willow rods, which they sometimes sink in the water, and sometimes use like nets. For fowling they employ an instrument consisting of a number of long slender thongs, to the ends of which stone pebbles or bits of walrus' teeth are fastened. This they throw up into the air with great dexterity among a flight of geese or other wild-fowl, and the birds, becoming entangled in the loose thongs which fly in every direction, are brought to the ground. Though the Tchuktches, as already mentioned, pursue the white bear, the flesh of which is a favourite article of food, they are not in general fond of the chase, although their country abounds in wild rein-deer and sheep, foxes, wolves, bears, and other large fur-animals. They have bows and arrows, but they are not particularly expert in their use. Their principal weapons are different kinds of spears, and particularly the batass already

described. Iron being scarce, they sometimes employ walrus' tusks instead. The settled Tchuktches use dogs for draft, but instead of harnessing them two and two, as is done on the Kolyma, they drive four abreast. Their sledges are also of a different construction, and rather resemble the rein-deer sledges, only they are not so large. The dogs are smaller than those employed for draft in other parts of Siberia, and inferior both in strength and swiftness. It is remarkable that in 1821, the Tchuktches lost great numbers of their dogs by the same malady as that which made such ravages among those of the Kolyma, the Indigirka, the Iana, and the Lena.

From much observation and repeated inquiries, it appears that a kind of bondage exists both among the settled and the nomade Tchuktches. We found among the wealthier people whole families who had always been in a state of servitude; they have no property, they cannot leave their masters, on whose arbitrary will they are entirely dependent, and are employed by them in all sorts of hard labour and attendance, in return for which they are fed and clothed. Neither our interpreter, nor the Tchuktches from whom we inquired, could give us any information respecting the origin of this state of things. They said, "It always had been so, and must continue to be so." Possibly the slaves are descended from captives.

The Tchuktches use only animal food; boiled rein-deers' flesh with seals' blubber is a frequent dish: they are particularly fond of the flesh of white bears, and of the skin of the whale with a layer of meat adhering to it eaten raw, which bears some resemblance to sturgeon. Meat broth is taken quite cold, and is often mixed with snow

and drank out of large wooden vessels as a beverage to quench thirst. Every individual carries about with him a little tube of rein-deer bone, through which he sucks up the liquid from the large vessel. Fish are not much esteemed, and only eaten when other food is wanting. Salt is never used. It is strange, that in a country of such intense cold, where one would suppose that every means of getting warmth would be most acceptable, every article of food is taken cold. They usually conclude their meals with a lump of snow, and I have often seen them, with a temperature of — 36°, and even colder, take up from time to time handfuls of fresh snow and eat it with great apparent relish.

On the 23rd of April we left Ir-Kaipie and continued our route towards the west. On the 24th we came to the place from which M. von Matiuschkin had begun his journey over the ice to make a last attempt to look for the northern land. We found a large wooden cross erected by him, with a short notice to the effect that he had met every where wide open places, and that after several attempts to advance further, the breaking-up of the ice in every direction had forced him to return, without having been more than sixteen wersts from the coast.

We slept on the 25th at Schalarov's hut, near the Werkon river, seven wersts N. 80° E. from Cape Kekurnoi. We found this building, which had been erected sixty years ago, in tolerable preservation. All the side timbers were standing; the roof only had fallen in. We examined the mingled earth and snow which filled the hut, and found some human bones, and a kind of pouch for cartridges, made of wood, which was

overgrown with moss. The Kamakai at Cape Chelagskoi afterwards told me that, when he was a boy of ten years old, several corpses had been found in the hut; and that five men of this unfortunate company had gone away on foot towards the Kolyma district.

Early in the morning on the 1st of May we reached Cape Chelagskoi, and roused the Kamakai who was still asleep, in hopes of obtaining some provisions from him. Unfortunately his hunting and fishing had been unsuccessful and he could scarcely spare us anything. He gave me a letter which M. von Matiuschkin had left with him for me, containing some more details of his proceedings during his unsuccessful attempt on the ice.

Our dogs were very much exhausted by their long journey, and their feet were so injured by the sharp ice, which had now lost its covering of snow, that their track was marked by spots of blood, and some of them were so lame that we were obliged to put them into the sledges to bring them along. The provisions both for them and for ourselves were quite consumed; and an attempt to meet with the Tchuktches, who usually visit Aiun or Sabadei Island with their herds of rein-deer had failed; they had left it, and nothing could be done except to follow the practice of the country, which is, when dogs are in a very bad condition, to drive them on without stopping, till they reach a place where they can have good food, and can rest for some time. We did so, and with much difficulty succeeded in reaching the balagan at the mouth of the Baranika, where we found sufficient provisions to admit of allowing our poor dogs two days' rest. We had had only

a light breeze, and a temperature of + 24°, but on the 3rd the thermometer suddenly fell to — 8°; however the cloudless sky made us amends for the severity of the cold, by enabling us on that and the following days to add some good meridian altitudes to our previous observations for latitude.

We resumed our route on the 5th of May. As we came nearer to Nijnei Kolymsk, the signs of approaching spring became more perceptible, the banks of the river were clear from snow, and although the ice was still strong enough to bear us, it was covered by the water formed by the melting snow, and brought down by the more rapid mountain streams which were now open. Draft was very difficult, and but for the strong smooth whalebone runners which we had purchased at Koliutchin, would have been impossible.

At length on the 10th of May, we reached Nijnie Kolymsk, after an absence of seventy-eight days, during which we had travelled 2300 wersts. M. von Matiuschkin had arrived six days before. During his homeward journey he had completed the survey of Tchaun Bay, without meeting with Tchuktches anywhere except at Cape Chelagskoi, where the Kamakai gave him a friendly reception but could not spare him a supply of provisions. The results of his journey were a number of good geographical determinations, into the details of which it is needless to enter; they will be found in the map, to which the reader is referred for a complete view of what our united labours have accomplished in this respect.

Our return to Nijnei Kolymsk closed the series of attempts made by us to discover a northern land; which though not seen by us, may possibly

exist, and be attainable from the coast of the continent under a combination of very favourable circumstances, the principal of which would be a long, cold, and stormless winter, and a late spring. If attempted in this way, it would be most advisable to leave the coast about Cape Jakan, which all the native accounts concur in representing as the nearest point.

We had now completed the execution of our instructions, and were free to leave Nijnei Kolymsk, and to commence our homeward route, as soon as it should be practicable. MM. von Matiuschkin and Kyber took their departure early in July. They ascended the Kolyma, went from thence to Verkni Kolymsk, and up the Omekon to Iakutsk, where they spent the summer in researches of natural history. I was detained at Nijnei Kolymsk until the 1st of August, when I received orders to await the arrival of a functionary at Iakutsk, who was commissioned to examine all my accounts with the inhabitants of the Kolymsk district, and all the payments which I had made them. Unfortunately the arrival of this person was long delayed, and though I occupied myself during the interval in arranging my journals, surveys, and maps, yet I own I felt this delay in the highest degree irksome, and a greater trial of patience than all our toils and difficulties hitherto.

At length the person arrived, the simple accounts were soon gone over, and all being settled, I left Nijnei Kolymsk with M. Kosmin, after a stay of three complete years. We soon reached Sredne Kolymsk, where we hired horses to take us to Iakutsk from our old acquaintance M. Bereshnoi, and on the 19th of November commenced our journey with a temperature of — 40°.

CHAPTER XV.

Return from Sredne Kolymsk to St Petersburgh.

On the 19th of November we left Sredne Kolymsk, with hired horses, which were to take us to Iakutsk. Instead of the post road through Saschiwersk and Tabalog, we followed the northern road which is taken by the trading caravans across the heaths inhabited by Iakuts, along the Selenächa river. Although by this means we traversed the country in quite a new direction, the uniformity which prevails throughout north-east Siberia is such, that a detailed description of our return to Iakutsk would be little more than a repetition of what has been said already; I will therefore confine myself to the mention of a few circumstances, which had not before fallen under my notice.

The preference given by the trading caravans to the route along the Selenächa, is on account of the excellent food afforded to their horses by a species of equisetum, which grows abundantly on the sandy banks of that river, and is not met with along the post road. In summer, this plant is bitter and distasteful to the horses, but the first frosts, without altering its green colour, give it a sweetish flavour; it is then much liked, and the horses soon become strong and fat from feeding on it. This useful plant, which is hardly an inch

in height, is known in the country by the name of Tchiboga. Although it requires frost to render it palatable, it is sometimes injured by a long continuance of extreme cold, which renders its hollow tubes so brittle, that the hoofs of the horses in scraping away the snow, destroy them.

We always tried to pass the night on the best spots for pasture, though they were not always the best in other respects. On the 9th of December, for instance, with a temperature of — 42°, we slept on an exposed plain, where we had no shelter from the north wind, round a fire kindled in the open air. I had a good opportunity of remarking in the Iakuts who accompanied us, the degree to which men can harden themselves, by long habit, against cold and exposure in the severest winter journey. The Iakuts do not use any kind of tent or covering, nor any of the larger fur garments, without which we could not venture into the open air when the cold had attained a certain intensity.

An Iakut, when travelling, wears only his usual in-doors clothing, and at night, spreads a horse-cloth on the snow, which, with a saddle for his pillow, forms the whole of his bedding; his only covering is the fur jacket which he has worn during the day, and which he pulls off, and puts over his back and shoulders, while the front of his body has scarcely any covering, and is turned to the blazing fire. When he has lain for some time in this way, and feels so warm that he is near perspiring, he stops up his nose and ears with little bits of fur, and covers his face so as to leave only an exceedingly small aperture for breathing, and this is all that he requires in the most intense cold, not to be frozen during sleep. Even in

Siberia, the Iakuts are called *iron men*, and I suppose that there are not any other people in the world who endure cold and hunger as they do. I have seen them frequently in the severe cold of this country, and when the fire had long been extinguished, and the light jacket had slipped off their shoulders, sleeping quietly, completely exposed to the heavens, with scarcely any clothing on, and their bodies covered with a thick coat of rime.

They are also remarkable for the acuteness of their sight. A middle-aged Iakut assured M. von Anjou, that he had several times seen that blue star, pointing to Jupiter, swallow up another very small star, and soon afterwards send it forth again: thus he had observed with the naked eye the immersion and emersion of one of Jupiter's satellites. Their memory and local sagacity are also very surprising, and are of the greatest use in their journeys through these extensive and unvaried wastes. A pool, a stone, a bush, a rise of ground so slight as to be hardly perceptible, objects which an European scarcely notices, are deeply impressed in their memory, and serve years afterwards to guide them over the trackless and desert steppe.

Our march was often rendered more difficult by a phenomenon peculiar to these regions, resembling the glaciers; though of quite a different origin. In valleys (particularly in the long valley of the Dogdo) where the gravelly soil is parched by the hot summer and the dry autumn which usually follows, it often happens that in the middle of winter, when the cold is most intense, a large quantity of water gushes up from the earth, spreads itself on all sides, and immediately freezes.

This first crust of ice is soon broken by fissures, through which fresh water rises, and a second crust is formed; and in this way fresh layers are added, as the effect of the frost presses up more water from deep cavities in the hollow ground, until at last the height of the whole mass is such, as to cover the bushes and shrubs, and even trees of moderate growth. These fields of ice, which are called *Taryni*, continue during the winter; and when they are melted by the force of the sun in spring, they form a number of streams of greater or less size, which rush down to the lowest levels, and sink into the earth as the ground thaws. On the Ochozk route, and in the Omekon mountains, large fields of ice are met with, which being in elevated places, and shaded from the sun, do not melt in the heat of summer. These masses are probably only formed by the accumulation of rain and snow-water, and differ therefore materially from the Taryni of the Dogdo river. The ice of the latter is of a dazzling white colour, and seems to contain a quantity of calcareous particles, as we judged from its taste, and from its being so hard as to be quite unfit for washing or for making tea. When the Taryni are completely frozen over they are both difficult and dangerous to cross. The surface is so smooth, that even horses properly rough-shod can scarcely keep their feet, and are often borne down by their loads, and not unfrequently killed on the spot. It is particularly dangerous, when, in passing a ravine, or a declivity thus covered, the caravan is caught by one of the furious and irresistible gusts of wind, common in this country, and which sometimes hurl men and horses down a precipice.

The passage of the Taryni is less dangerous,

but not less troublesome, when they are covered with a fresh overflow of water not yet congealed, and the caravan has to wade through the ice-cold water, which sometimes causes both hands and feet to freeze. But the hardy Iakuts are not hurt: after wading through an ice-cold bath of this kind, and their high fur boots (torbassy) being completely wetted through, they plunge their legs two or three times in the snow; this draws out the water through the skin of which the boot is made, and forms a crust of ice which is easily scraped off; if the time suits, the boots are then dried by a fire, but this is usually deferred till the night halt.

On the 22nd of December, we arrived at Verkhoiansk (called by the Iakuts, Boronuk), where we took leave of our friend Bereshnoi. His horses had brought us from Sredne Kolymsk, a distance of 1224 wersts in thirty-two days. The little town of Verkhoiansk consists of only five wooden houses, and a newly-built church of the same material, which is not yet consecrated. It is on the western side of the Iana, but will probably be transferred in time to the opposite side, as, from the bend of the river, the bank on which it stands is gradually undermined. I stayed at the house of M. Gorochow, a merchant; and my surprise and pleasure were great on seeing there a good-sized, neat, and clean room, with regular windows, good furniture, a handsome fire-place, some prints, and above all a small book-case, containing a collection of our best authors. It was years since I had seen any book, except the very few which I had brought with me. Whilst enjoying the unexpected sight of these marks of civilized taste and intellectual cultivation, I was summoned

to table, and after living three years upon raw and dried fish, I must own that the well-arranged board, clean cookery, and European dinner, formed a very pleasant addition to the agreeable conversation of my host, and M. Michailou, the commissioner of the district. The latter gentleman informed me that the Ustiansk expedition had passed through, early in November, on their way to Iakutsk.

Verkhoiansk, which is situated, according to our observations, in latitude 67° 33′, is the headquarters of M. Michailou, who has the superintendence of the Iana, Indigirka, and Jigansk circles; a district equal in extent to France, but of which the whole population does not exceed that of one of our largest villages. Nevertheless, the commissioner, who goes round this great desert every year, with a secretary and clerk, finds enough to do; for, wherever there is even a couple of families, there is some dispute to be adjusted.

The people about Verkhoiansk are Iakuts, and their chief occupation is the care of cattle, to which the hilly country, and the milder climate of the sheltered valleys are very favourable. There is also much less snow here than in other parts of north-eastern Siberia, so that the cattle can be left out in winter, and can find sufficient pasture. This is the more important as, from the very dry summers, the growth of grass is never such as to afford a good stock of hay. There are, generally speaking, fewer lakes abounding in fish, than in the Kolyma district; but some of the lakes are full of such an immense quantity of a small species, only two inches in length, that they are taken out of the water with buckets. These little fish, which are preserved for the winter by being

frozen, furnish a very good article of food, pounded and boiled with the finely-grated inner bark of the larch-tree. Hunting is much followed. Hares and grouse abound; and the country is rich in fur animals; elks, rein-deer, black-bears, wolves, musk-deer, red-foxes, ermines, wolverines, and squirrels of the most valuable kinds, are all numerous; black-foxes are rare, and sables are not found here. The musk deer (Moschus moschiferus), called here Kabarga, must be abundant, as a pound of musk is commonly sold for from ten to fifteen roubles.

The character of the Iakuts of Verkhoiansk has been injured by constant intercourse with their countrymen of Iakutsk, and litigiousness, quarrels, dishonesty, and a passionate love of card-playing, are equally general among both. Distrust of their neighbours induces them to keep their cattle at night in the jurte which they inhabit, the pestiferous atmosphere of which defies description. The Iakuts who live near the Kolyma, are far more cleanly in their habits; their dwellings are better and neater, and they are better dressed; this is particularly the case in those settlements which are at some distance from the route, along which the traders who carry brandy pass on their way from Iakutsk to Kolymsk.

During my stay at Verkhoiansk, a kind of epidemic catarrhal fever prevailed throughout the district; the symptoms were violent oppression of the chest, noise in the ears, head-ache, &c. It made its appearance, when, after an unusually thick fog which lasted a week, intense cold set in suddenly, and increased from day to day. From the 23rd to the 26th of December the temperature was — 49°, — 58°, — 62°, and — 64°. A Cos-

sack, whom I had previously sent forward with my papers, died of the epidemic. Every one was more or less ill; I suffered most from a painful constriction of the chest, which did not leave me until after my arrival at Iakutsk, where I had medical assistance. It is a general opinion here, that this, and other dangerous epidemics which prevail among the natives, are not nearly so formidable to those who have but lately arrived in the country; but when strangers have been exposed to the climate for some time they lose this advantage.

We stayed over Christmas-day, and left Verkhoiansk on the 27th of December. The cold still continued, and the thermometer constantly indicated — 58°. In such a temperature a journey in sledges would have been very disagreeable, but on horseback, the actual suffering is such as cannot well be imagined by those who have not experienced it. Covered from head to foot in stiff and cumbrous furs, weighing thirty or forty pounds, one cannot move; and under the thick fur-hood, which is fastened to the bear-skin collar, and covers the whole face, one can only draw in, as it were by stealth, a little of the external air, which is so keen that it causes a very peculiar and painful feeling to the throat and lungs. The distances from one halting-place to another take about ten hours, during which time the traveller must always continue on horseback, as the cumbrous dress makes it impossible to wade through the snow. The poor horses suffer at least as much as their riders, for, besides the general effect of the cold, they are tormented by ice forming in their nostrils, and stopping their breathing; when they intimate this, by a distressed snort and a

convulsive shaking of the head, the drivers relieve them by taking out the pieces of ice, to save them from being suffocated. When the icy ground is not covered by snow their hoofs often burst from the effect of the cold. The caravan is always surrounded by a thick cloud of vapour; it is not only living bodies which produce this effect, but even the snow smokes. These evaporations are instantly changed into millions of needles of ice, which fill the air, and cause a constant slight noise, resembling the sound of torn satin or thick silk. Even the rein-deer seeks the forests to protect himself from the intensity of the cold; in the tundras, where there is no shelter to be found, the whole herd crowd together as closely as possible, to gain a little warmth from each other, and may be seen standing in this way quite motionless. Only the dark bird of winter, the raven, still cleaves the icy air with slow and heavy wing, leaving behind him a long line of thin vapour, marking the track of his solitary flight. The influence of the cold extends even to inanimate nature; the thickest trunks of trees are rent asunder with a loud sound, which, in these deserts falls on the ear like a signal-shot at sea; large masses of rock are torn from their ancient sites; the ground in the tundras, and in the rocky valleys, cracks, and forms wide yawning fissures, from which the waters which were beneath the surface rise, giving off a cloud of vapour, and become immediately changed into ice. The effect of this degree of cold extends even beyond the earth; the beauty of the deep blue polar sky, so often and so justly praised, disappears in the dense atmosphere which the intensity of cold produces; the stars still glisten in the firmament, but their brilliancy is dimmed.

We had still before us the difficult passage of the Verkhoiansk mountains, the foot of which we reached on the 4th of January, 1824. A violent and cutting wind, blowing through the ravines, obliged us to seek shelter in a powarna. At sunset the whole country became covered with a thick icy mist, which the wind drove towards us from the narrow mountain passes; a storm of wind followed, which must have overthrown our frail shelter, if its lowness had not saved it. The gale lasted till the following morning, when it subsided, the atmosphere cleared up, and the temperature rose to — 11°, which, by comparison, seemed mild. We hastened to avail ourselves of this favourable change to begin our passage across the mountains. On the 7th of January we had reached the other side of them, and entered a fine fir-wood, the evergreen beauty of which was the more striking, from the recent storm having swept the snow from the branches. On the 10th of January we arrived at Iakutsk, where I found my valued friend, Lieutenant Anjou, who had returned in safety from his difficult journies along the Iana, and across the Polar Sea; and passed many happy hours with him in recounting our respective adventures.

Since we had been at Iakutsk four years before, many changes had taken place. The old Ostrog had been pulled down, and the materials had been employed in constructing a kind of club-house and assembly-rooms, where I saw a well-lighted ball-room, a buffet with refreshments, a billiard-room, a card-room, &c. Public dinners and dances were given, and sometimes the ball-room was even turned into a theatre.

With our arrival at Iakutsk the expedition ter-

minated, and all our companions dispersed to regain their homes. M. von Anjou and I were still detained for another month to close our accounts; this was at last completed, and we left Iakutsk together on the 8th of February for Irkutsk, where we arrived on the 25th, and found Dr. Kyber awaiting us. We requested permission from the Governor-General, M. von Lawinski, to visit the warm springs of Turinsk, on the other side of the Baikal, which relieved us so far from the severe rheumatic affections caused by our journies over the Polar Sea, as to make us amends for the delay in our return to St. Petersburgh, which we did not reach until the 15th of August, 1824, MM. von Matiuschkin and Kosmin having arrived three months before us.

CHAPTER XVII.

Brief Notices of the Ustiansk Expedition under Lieutenant Anjou, 1821-22-23.*

THE objects of the expedition under the command of Lieutenant Anjou, which was to commence its operations from Ustiansk or Oust Iansk, on the Iana, were as follows:—

1st. The survey of the Islands in the Polar Ocean lying opposite to the mouth of the Iana, and of the coast of the Continent on either side of that river.

2nd. The discovery of the land which Sannikoff thought he had seen in a north-west direction from the northernmost point of Kotelnoi Island, at an estimated distance of seventy wersts; and also at about the same distance to the N.E. of Fadejevskoi Island.

These researches were to be carried on in the spring, when the sea is still covered with solid ice.

Lieut. Anjou accompanied by M. Iljin, mate, M. Bereshnich, second mate, Dr. Figurin, surgeon, and two sailors, arrived at Ustiansk in the beginning of the winter of 1820. After collecting the requisite number of sledges and dogs and a suitable supply of provisions, he hastened to remove his dogs from the influence of the epidemic then prevailing amongst those

* Translated from a MS. communicated by Admiral von Wrangell to Lieut.-colonel Sabine.

animals, by sending them to Point Bikovskoi, on the easternmost embouchure of the Lena; the magazine of provisions was formed sixty wersts further to the north on the Island of Barkin.

On the 8th of March, (old style) 1821, M. von Anjou arrived at Cape Bikovskoi, where he was detained by a violent storm until the 16th. On the 21st he took his departure from Barkin Island with thirty-four sledges for Stolbovoi Island, of which he surveyed the entire coast; the empty sledges were then sent back, and the Expedition proceeded to the wintering station near the Belsowaia stream on the west coast of Kotelnoi Island. From this place the commander despatched M. Bereshnich with a division of fifteen sledges, with orders to survey the south coast of the Island, and afterwards to cross Fadejevskoi Island to the station on its northern coast called Great Camp, and there to deposit the provisions in the magazines built by the Russian hunters, who visit this place annually from Ustiansk. The empty sledges were then to be sent back, and the remainder of the party were to await the arrival of M. von Anjou, occupying themselves in the meantime in preparing a baidar or leathern boat, which might be serviceable in crossing lanes of water when pushing northward over the ice.

M. von Anjou accompanied by Dr. Figurin followed the western coast of Kotelnoi Island until he reached its north-western extremity, whence he took his departure on the 5th of April across the ice of the sea towards the N.W., i.e. directly towards the supposed land of Sannikoff. It was necessary to open a path across high and rugged hummocks by means of crow bars; at a distance of twenty geographical miles from the Island,

the soundings were fifteen fathoms and the bottom mud; after proceeding twelve miles further, vapours were seen rising from the sea to the N.W.; an easterly breeze cleared the horizon, and the N.W. point of Kotelnoi Island was distinctly seen at a distance of thirty-two miles, bearing S. 25° E. by angles. The party then took a due north course and after proceeding ten miles found seventeen fathoms soundings. The observed latitude by meridian altitudes was here 76° 38′; the near vicinity of the open sea now forbade further progress, and M. von Anjou saw himself compelled to return to the wintering station, where he arrived on the 8th of April. He then continued the survey along the north coast of Kotelnoi Island, and arrived on the 12th at Great Camp, where he found M. Bereshnich, who had fulfilled all his instructions.

On the 14th M. von Anjou made a fresh attempt to reach the supposed land in a N. 15° W. direction, but at the end of seven miles the party were stopped by thin ice. M. von Anjou then left the sledges, and attempted with a few companions to advance further on foot, but they had hardly made good three wersts when the ice became so unsafe that they were forced to return. At the place where the sledges had halted the soundings were fifteen fathoms, and the bottom mud. On the way back to the shore a white bear was killed.

The survey of the northern coast of Fadejevskoi was then continued as far as Cape Blagovichenie, dense vapours, indicating the vicinity of the open sea, being seen to the northward throughout the journey. The expedition then crossed Blagovichenskoi Strait to Cape Wissokoi, in New Siberia,

which they reached on the 18th, and from whence they saw to the northward the open sea, with drift ice. The party then continued their course along the shore, constantly seeing dense vapours rising from the open sea, until they came to Cape Räboi, where the ice appeared unbroken, and from whence accordingly they attempted, on the 22d, to advance in a direction as nearly north-easterly as the lofty hummocks permitted. At the end of sixteen miles the vicinity of columns of vapour, and almost impassable hummocks, caused them, first to alter their course, and after proceeding five miles more in an easterly direction, to make for the land, which they reached on the 23d, at Cape Kammenoy. The advanced season, and the exhausted state of the dogs, now made it necessary for the expedition to return to the continent, which they reached on the 30th of April, and Ustiansk on the 9th of May, after a journey of fifty-four days, reckoning from Cape Bikovskoi. Five white bears had been killed at different times.

With the view of facilitating the next year's operations, M. von Anjou caused deposits of provisions to be formed at the Urianchastock river, near the Svätoi Noss, at the northern point of Liakhow Island, and on the south coasts of Fadejevskoi Island, and of New Siberia, besides the provisions which had been left from the former year at the deposit on the northern point of Fadejevskoi Island.

On the 27th of February, 1822, M. von Anjou, with a division of his expedition, took their departure from Ustiansk, arrived on the 1st of March at the village of Murasch on the sea coast, and started from it on the 3rd of March, with the necessary provisions, and eight sledges, for the first

deposit of provisions near the Svätoi Noss. From this place M. von Anjou dispatched on the 10th M. Bereshnich, with two sledges, to the most western point of Liakhow Island, with instructions to survey both that island and the smaller one of Maloi, whilst he himself hastened with the six remaining sledges to the deposit on the northern point of Liakhow Island; he arrived there on the 12th, and having replenished his store of provisions for the dogs, proceeded to the Great Camp, which he reached on the 18th. With a faint westerly breeze, vapours rising from open water were seen in the north. On the 21st they left this place, and followed the coast of the island of which Cape Krestowoi had been hitherto regarded as the northern extremity, but the closer examination of M. von Anjou shewed the true turning point to be ten miles further to the north-west. About five miles from this point (the north-western extremity of the island,) a blue appearance not unlike that of distant land, was seen in the horizon in N. 20° W., and a reindeer's track directed towards it increased the hope thus raised. But the next day, after following these indications for fourteen miles, and encountering very rugged hummocks, the blue spot on the horizon vanished; two miles further on, the progress of the party was stopt by thin ice, and at the same time the traces of the reindeer also disappeared. The hunters in these countries have remarked from long observation, that these animals frequently go over the ice to considerable distances from the shore, to get at the salt left by the evaporation of the sea water, of which they are extremely fond. At this point soundings were eleven fathoms, bottom mud and fine grey sand. M. von Anjou now followed the edge

of the thin ice for seven miles, when he discovered in the S.S.W. a hill, which had the appearance of belonging to a great land which seemed to extend to the westward. But on reaching the hill the discovery proved to be that of a low island, about five miles in circumference, to which the name of Figurin was given. Its eastern side formed a promontory seventy feet high, its western side was low and flat. On the south the bed of a stream was noticed, in the mouth of which lay drift-wood of larch, and traces of bears and grouse, and old nests of geese were found on the island. On the 26th of March, the party went from Figurin Island fifteen miles in a N.W. by W. direction, across large hummocks, when their course was again arrested by thin ice; here they sounded and found ten fathoms, mud with sand. They then turned in a S. 60° W. direction, following the edge of the thin ice, and had accomplished a distance of seven miles, rendered very difficult by the abundant salt, when the open sea, with drifting masses of ice presented itself, and obliged them to seek a less dangerous halting-place for the night, two miles distant to the S.S.W. Large fissures opened in the ice with great noise, and the water was forced up through these by the wind, and spread itself in parts over the surface. On the next day the party advanced towards the west, seeing vapours rising from the sea to the north of them, and at the twelfth mile an advance to the northward was again attempted on foot, but they had only gone fifty fathoms when the open sea forbade further progress. Although the wind was westerly, the pieces of floating ice were seen to drift from east to west. The sledge drivers, who were all hunters, frequenting these islands, were

of opinion that this current was the ebb tide, the regular six hourly return of which they had always noticed on the north coasts of these islands during summer. Soundings gave twelve fathoms, mud with fine grey sand. The thin ice brought the travellers continually nearer to the N.W. point of Kotelnoi island, and after crossing a range of large hummocks they reached the shore.

The attempts both in this and in the preceding year to reach, by the ice, the land which Sannikoff supposed that he had seen, having both resulted in proving experimentally that to the N.W., N., and N.E., the islands of Kotelnoi, Fadejevskoi and New Siberia, are surrounded at a distance, varying from sixteen to thirty-six miles, by thin ice and open sea, M. von Anjou determined on giving up further attempts of the same kind, and on turning all his attention to the survey of the coasts. This was completed with the necessary exactness, being made to rest on a series of astronomical determinations of position. Nothing remarkable was met with except the so-called "wooden mountains" on the south coast of New Siberia. This name is applied to a part of the shore extending about five wersts, and rising abruptly from the sea to a vertical height of twenty fathoms. It consists of earth in which are imbedded planks, lying in an horizontal position in heaps of fifty, sometimes more, sometimes less, and the ends cropping out. The thickest planks were $2\frac{3}{4}$ inches in diameter, the wood was brittle, semi-hard, of a black colour, faintly shining, imperfectly combustible, and with a pitchy smell.

When the coast survey was completed, M. von Anjou finding that he had still a good supply of provisions remaining, determined on making a fresh

attempt over the ice to the eastward from New Siberia, where M. von Hedenstrom had tried without success in 1820, but the prevalence of westerly winds during the preceding winter appeared to justify the hope of finding a considerable extent of firm ice in that direction. On the 9th of April he accordingly took his departure from Cape Kamennoy; on this occasion a supply of driftwood was carried which had been previously unnecessary. A north-easterly direction was followed as nearly as possible, great difficulties being encountered by reason of hummocks and uneven ice. On the 11th ascending vapours were seen to the north, and on the 14th, having made good about sixty miles from Kamennoy, thin ice was met with extending towards the south-east. Here a white bear was killed, and soundings were taken, fifteen fathoms mud. The edge of the thin ice was then followed to the S.E., columns of vapour to the eastward shewing that there too the sea was not covered by ice; three open places were gone round, where the depth of the sea was found to be thirteen fathoms, with mud bottom; further south twelve and a half fathoms were found. Impassable hummocks, and the approaching failure of food for the dogs, obliged M. von Anjou to make for the continent, which he reached on the 27th near the river Krestowaia, having been eighteen days from land; he then proceeded to join M. von Wrangell, at Nijnei Kolymsk, where he arrived on the 5th of May.

Meanwhile another part of the expedition under the Mate, Ilgin, to whom M. von Anjou had entrusted the survey of the coast of the continent westward from the mouth of the Lena, had proceeded in the execution of this service as far as the river Olenek.

M. von Anjou having, as he considered, arrived at the conviction that all efforts to advance by the ice to any considerable distance from land must prove unavailing, now offered to attempt the same object with a boat, but the Admiralty regarding this project as too hazardous, refused their consent. The expedition was now directed to employ the following spring, 1823, in surveying Belkova Island, and in examining the sea to the westward of that island.

On the 10th of February M. von Anjou left Ustiansk for the little island of Lach, near Cape Bikovskoi, where he remained from the 14th to the 21st, to complete the preparation of the sledges and dogs. He then went with six sledges along the sea shore to Barkin, where he took in a supply of drift-wood. He had been informed that in 1815, a Iakut Maxim Lächow had discovered two small islands to the west of Stolbovoi, and that in the parallel of those islands the sea is found to be frozen much farther to the westward than elsewhere. On the 25th he took his departure in a N. 10° E. direction; at the end of fifty-nine miles a large crevice was met with; and on the 28th of February, in lat. 74° 25′, where the edge of the thin ice was attained, they found fourteen and a quarter fathoms soundings. It now became necessary to alter the course to an easterly one, so as to follow the edge of the thin ice, and of the line of vapours which indicated the presence of open water, and on the 2d of March they reached Vassiliev Island, one of those discovered in 1815. This, and the neighbouring island of Semenov were surveyed, and their position astronomically determined, and on the 6th the journey was continued as nearly northward from

the northernmost point of the latter island, as the hummocks which were met with permitted. On the 9th of March, the party found themselves on ice less than two inches in thickness: from this point, (where they had soundings twenty-one fathoms, mud), they withdrew twelve miles N. 60° E. before halting for the night. Next morning they followed along the line of ascending vapours, in a N. 15° E. direction, and after going ten miles found themselves among very large hummocks, which had manifestly been very recently formed by the heaping-up of freshly broken ice: soundings again shewed twenty-one fathoms, mud. Nine and a half miles of very difficult travelling now brought the party to the island of Belkova, which they proceeded to survey, and determined its position astronomically. Its western side is formed by a high cliff, which seemed to be sandstone, and its eastern shore is partly earth, and partly a slaty rock. Drift-wood is found abundantly all round the island.

The observations being completed, the party crossed the ice to the wintering station on Kotelnoi Island, and then traced the whole of the western shore to its southernmost point at Medveji, correcting and confirming the previous survey by astronomical determinations. On the 21st of March they left Kotelnoi Island, and reached the village of Murasch on the mainland, on the 27th, and Ustiansk on the 28th. Here Lieutenant Anjou found orders directing him to close the operations of the expedition, and to return to St. Petersburg.

The geographical determinations obtained by the Ustiansk expedition are given in Appendix.

APPENDIX.

I.—GENERAL REVIEW OF THE PROGRESS OF GEOGRAPHICAL KNOWLEDGE RESPECTING SIBERIA.

Gradual Discovery of the Siberian Coast.—General Review of the Voyages undertaken previously to the Year 1820, *in the Polar Ocean, between the Sea of Karskoie and Behring Straits.—Inaccuracies of the Maps and Surveys.—Object of the Expeditions undertaken in* 1820—1823, *on the Polar Ocean and along the Northern Coast of Siberia.*

THE whole of the immense extent of country from the White Sea to Behring Straits, embracing 145 degrees of longitude along the coast of Asia and Europe, has been discovered, surveyed, and described by Russians. All the attempts of other maritime nations to find a passage by the Polar Sea from Europe to China, or from the Pacific into the Atlantic, have been limited, in the West, by the Karskoie Sea, and in the East by the meridian of Cape North. The impediments, which stopt the progress of others, have been conquered by Russians, accustomed to the severity of the climate, and to the privations inseparable from it.

The first voyages to these icy deserts were undertaken by private individuals, attracted by the hope of large profits from a trade in the costly furs of the animals with which those regions

abound. At a later period, armed expeditions were sent out by the government, sometimes by land, and sometimes by sea, in large flat boats,* which creeping along the coast, reduced the tribes residing there, successively, to Russian subjection. At a still later period scientific expeditions were sent out by the Government at a considerable expense, the sole object of which was to make an accurate survey of the countries already visited, and to discover others. Many of these voyages to the coasts and islands of the Polar Ocean having hitherto remained entirely unknown to the public, a brief review of the labours of those who preceded me, to which occasional allusion is made in the narrative, may not be without interest and importance.

The coast of the Polar Ocean was partially known to Russian navigators as early as the middle of the 16th century. They were accustomed to sail in small flat vessels, or ladii, from the White Sea and from the mouth of the Petchora, across the Sea of Karskoie, as far as the entrances of the Obi and Ienissei. Sometimes they performed the whole voyage by sea; in general, however, to lessen the distance, they were in the habit of drawing their boats across the isthmus which divides the Gulph of Obi from the Karskoie Sea. In the latter case, their route was as follows: they sailed from the Karskoie Sea up the river Mutnaia, and after a navigation of eight days, reached two lakes of about ten or twelve miles in circuit. There they unloaded their cargoes, and drew their boats over a neck of land 200 fathoms

* *Kotschy*, broad, flat, decked-boats, of about twelve fathoms in length. They are usually impelled by oars, but, when the wind is favourable, make use of sails also.

in breadth, to Lake Selenoi, whence by the river of the same name, they descended to the Gulf of Obi. The return by sea from the Obi to Archangel occupied generally three or four weeks; the distance from the Obi to the Ienissei, however, was generally performed in two or three weeks.*

We find it stated in Fischer's "*History of Siberia,*" and also in Müller's "*Nachrichten von Seereisen,*" that in the year 1598, Fedor Dyakow was sent from Tobolsk to demand *yassak* or tribute from the Samoïedes of the Ienissei; and we are told by the same authority, that in 1600, under the government of Godunow, in order to secure the Russian ascendancy, a town named Mangaseia was built on the river Iasa, in the country of the Samoïedes. This town was afterwards removed to the river Turuchanka, where in 1607, the Cossacks, incessantly occupied with the reduction of the Samoïedes, Ostiaks, and Tunguses, had established a wintering station to which they had given the name of Turuchansk. From this station the Cossacks descended the river Ienissei, the mouth of which they reached in 1610. The detailed reports of their discovery led to a new expedition.

In the same year there was formed at Mangaseia, a company composed of merchants and *promischlenniki* or fur-hunters, having a two-fold object in view: viz. discovery and trade. The members of this association repaired to the new Cossack settlement of Turuchansk, built a few kotschy with which they descended the Ienissei, and after a navigation of four weeks reached the Polar Ocean, or Cold Sea, as they denominated

* Voyage of Captain Lütke, vol. i., page 76.

it. The masses of ice which they encountered obliged them to remain at anchor for five weeks, till a violent gale from the south broke up the ice and enabled them to put to sea. These people assure us that they met with ice more than thirty fathoms thick. Of this expedition nothing further is known than that it reached the mouth of the Pässida river.*

By following the course of the Tunguska and that of the Vymoi, both which rise in the same chain of mountains, the former falling into the Ienissei, and the latter into the Lena, the Cossacks of the Ienissei were led in 1630 to the important discovery of the Lena, by means of which they were enabled greatly to extend the subjection of the native inhabitants of Siberia. Among others the Cossack Jelissei Busa, was sent from Ieneseisk to the Lena, in 1636, with orders to examine all the rivers that fall into the Polar Ocean, and to impose a yassak upon all the tribes dwelling among them. Busa set out, accompanied by only ten Cossacks, and wintered at the little fortress of Olekminsk, where he added forty fur-hunters to his party, and continued his expedition in the spring. In a fortnight he arrived at the western mouth of the Lena; and, after a navigation of twenty-four hours on the Polar Ocean, reached the entrance of the Olekma, which he ascended, and passed the winter among the Tunguses, on whom he imposed a yassak. In the spring of 1638, Busa and his party returned to the Lena,

* The whole country about the Lower Ienissei is said to have formerly borne the name of Pässida, which in the Samoïed dialect means a flat plain without wood. The greater part of Northern Siberia, along the Polar Sea, consists of such naked plains, which in the language of the country are called Tundra.

which he reached at the point where it receives the Moloda, and built two small vessels, in which he descended the Lena, and in ten days reached the ocean. Five days afterwards, he discovered the mouth of the Iana; and, after ascending the river for three days, fell in with some tribes of Iakuts, on whom, as usual, he levied a considerable yassak.

On the Iana, Busa built four new vessels, with which, on the return of spring, he descended the river; and by one of its arms, running eastward, entered the River Tshéndoma, where he found a settlement of Iukahirs, living in half subterranean huts, with whom he remained two years, examining the country, and levying a large yassak on this and several neighbouring tribes.

About the same time that Busa entered the Iana, the Indigirka was discovered by Ivanow, surnamed Postnik or Observer of Fasts. He subdued the Iukahirs scattered along the banks, and established a wintering station, where he left a garrison of sixteen Cossacks, who, after the departure of their chief, built a couple of boats, with which they examined the course of the river to its mouth, and received tribute from the inhabitants. They even ventured a considerable distance out to sea, and seem to have obtained some knowledge of the mouth of the Alaseia.

We have no positive knowledge of the period at which the Kolyma was discovered. Fischer, in his History of Siberia, mentions it for the first time in 1644, in which year the Cossack, Michael Staduchin, formed a winter-establishment at about 100 wersts from its mouth, from which afterwards arose the little town of Nijnei Kólymsk. From Staduchin we have the earliest accounts of the

warlike nation of the Tchuktches, and of a large island situated further to the North in the Polar Ocean. He had been assured that an island was visible from the coast, somewhere between the mouths of the Iana and Kolyma; and that the Tchuktches were in the habit of going over in one day in their reindeer sledges, and returning with valuable loads of walrus teeth. The fur-hunters scattered about the country confirmed this report, maintaining, however, that the supposed island was only a continuation of Novaia Zemblia. Staduchin also heard much of a large river by the name of Pogytsha, or Kowytsha, which he was told fell into the ocean about three days' sail further to the east.

The greater part of this information was subsequently found to be incorrect. The large island can have been no other than the small one bearing on our maps the name of Krestowoi, and which belongs to the group of the Bear Islands. Though of small extent, it can be seen from the coast in clear weather, and it is also true that the tribes on the Tchukotch River can go across the ice to it in one day in their rein-deer sledges. It is also possible that the natives may even then have had some indistinct knowledge of the islands lying opposite to the mouth of the Iana; and that this may have led to some confusion in their description of the Bear Islands.

The first attempt to navigate the Polar Ocean to the east of the Kolyma, was made in the year 1646, by a company of fur-hunters under the guidance of Issai Ignatiew. The sea was covered with thick drift-ice; nevertheless, the navigators found a narrow passage, through which they advanced with little impediment for two days, when

they ran into a bay surrounded by rocks, and obtained by barter some walrus' teeth from the Tchuktches dwelling there. Their ignorance of the language of the natives, and the warlike disposition of the latter, made it appear prudent not to venture farther; and Ignatiew returned to the Kolyma. From his imperfect report it is difficult to judge how far his voyage extended; from the time employed, however, it is probable that he reached Tchaun Bay, in which, opposite the Island of Arautan, there is such an inlet as he describes, surrounded by steep rocks.

Ignatiew's account of a nation rich in walrus' teeth, and not yet subdued, was sufficient to stimulate the restless conquerors of Siberia to a new undertaking, which did not appear to present any greater difficulty than those they had already overcome. They resolved on an expedition into the country of the Tchuktches, from which they promised themselves, not without reason, important advantages and large profits. A company of fur-hunters was accordingly formed under the guidance of Fedot Alexeiew, a man in the service of a Moscow merchant; and the necessary preparations for the expedition proceeded with the greatest activity and zeal. At Alexeiew's request, a government functionary was attached to the expedition, for the purpose "of attending to the interests of the crown;" this person was the Cossack Semen Deshnew, who afterwards distinguished himself by making the voyage round the north-eastern extremity of Asia.

In June 1647 the expedition sailed in four vessels from the Kolyma, designing to reach the River Anadyr, which, it was supposed, fell into the Polar Ocean. The immense fields and hum-

mocks of ice, however, which the navigators encountered, obliged them, after many vain efforts, to return to Nijnei Kolymsk.

Staduchin's report of the river Pogytsha, and of a large island in the Polar Ocean, had, in the meantime, induced the authorities at Iakutsk to send him back to Nijnei Kolymsk, with orders to proceed in search of the supposed river, and to reduce the tribes residing there under Russian subjection. Staduchin left Iakutsk in June, 1647, wintered on the banks of the Iana, and, towards the end of the winter, arrived on the Indigirka, where he built himself a vessel, in which he proceeded to Nijnei Kolymsk. It was not till 1649 that Staduchin sailed from the Kolyma in search of the Pogytsha. He had procured a second vessel for this purpose, which was wrecked almost immediately after starting. He then continued to sail in an easterly direction for seven days, without finding the mouth of any important river, nor was he able, on landing, to obtain any information on the subject from the natives. The crew obtained some walrus' teeth by barter, but could get no provisions of any kind. The steep and rocky character of the coast, according to Staduchin, made it impossible to fish; so, as the ship's stores were nearly exhausted, he was obliged to turn back, without having obtained the object of his voyage. From the time occupied, it is probable that Staduchin and his companions must have been beyond Cape Chelagskoi. This is also borne out by his description of the coast, which, in the vicinity of that cape, consists of rocks and cliffs projecting to a considerable distance into the sea.

The failure of the first attempt to reach the Anadyr did not discourage the indefatigable adventurers. On the contrary, the candidates for a second expedition were so numerous, that shortly after Alexeiew's return (1648) seven new vessels, or *kotschy*,* were built, and in the following year were able to proceed to sea. Four of them were probably lost,† as Müller speaks only of three, which were commanded by the Cossacks Semen Deshnew and Gerasim Ankudinow, and by Alexeiew as leader of the fur-hunters.

Deshnew was so firmly persuaded that his voyage would prove prosperous, that, on his departure,

* Burney, in his "*Chronological History of North-Eastern Voyages*," is of opinion that these vessels were not kotschy, because the expression does not occur in Coxe's extract from Deshnew's original report, and derives the name from the English word "ketch." I believe, however, that all the vessels, used about this time by the Siberian navigators, were of very nearly the same character, and must all be described by the same term. This is confirmed by Müller, who says in a note at page 373, "The kotschy must have the length of twelve fathoms; in every other respect, all that is required of them is, that they should bear the outward appearance of a ship."

† Burney says, in the work just mentioned, but without assigning any authority, that these four vessels were wrecked on an island north of the Kolyma, and that the crews were saved. In Berg's "*Geschichte der Nordlichen Polarreisen*," in which much is said about people with beards said to dwell in America on the river Jassuweren, we find the following passage, page 89: "The belief in the existence of this people is founded upon the circumstance that four of Deshnew's kotschy were lost there." Lastly, in a periodical work, the *Sibirskoi Vestnik*, 1821, we find it asserted that the island Kotelnoi, opposite the mouth of the Iana, had been peopled by the crews of those four vessels, whereas it is known that the island is completely desolate and uninhabited, besides which it is scarcely possible that the vessels could have been wrecked there. These vague and contradictory accounts show, that nothing positive is known of the fate of these four kotschy.

he promised to bring back at least 280 sable skins* from the banks of the Anadyr. On the 20th of June, 1648, he set sail with his small squadron, undeterred by the countless hardships and dangers that awaited him in the inhospitable regions which he was to be the first to explore; and, doubtless, little foreseeing that to him and his bold companions would the honour belong, of being the only persons, to the present day, who have completed a voyage by sea from the Kolyma to the Pacific Ocean.

It is much to be regretted that we possess no circumstantial and precise account of this remarkable voyage. All that we know of it is gleaned from the meagre reports which Deshnew forwarded to the authorities at Iakutsk, to whom he relates his misfortunes, but makes only casual allusions to the voyage itself.† His report commences with a description of a promontory, which he calls the Great Tchukotsky Noss, consisting entirely of steep rocks. He distinguishes this from another promontory, to the west of the Kolyma, on the river Tchukotschoi. The Great Tchukotsky Noss

* "These skins," observes the 'Sibirskoi Vestnik,' "were the golden fleece of those days and of those regions, and tempted not only Cossacks and fur-hunters to brave the severest hardships, but even induced persons of much higher rank to leave their families and abandon the conveniences of life, in order to plunge into the fearful and unknown wildernesses of Siberia, in the hope of enriching themselves by the fur-trade. It is to the credit of the national character, however, that their desire of gain never drove them to the atrocities of which the gold-thirsty conquerors of Peru and Mexico were guilty."

† These remarkable documents are now in the Imperial Library at St. Petersburgh. It is singular that Deshnew makes no mention even of impediments by ice; this justifies the conclusion that he met with open water, the more so as he says, on one occasion, "this part of the sea is *not always* so free from ice."

was not, however, the first cape that Deshnew passed after leaving the Kolyma. He had previously met with another, the Svätoi Noss, or Holy Promontory; but the former is much larger, and was the more remarkable to Deshnew, because Ankudinow's vessel was wrecked there, and because some of the natives, while rowing about in their boats, were captured there by the Russians. Of Tchaun Bay, as of the island Koliutchin, he makes no mention, nor of the many other remarkable points which he must have passed during his voyage from the Kolyma to Behring Straits. Nevertheless, from his description of the Great Tchukotsky Noss, from its direction in regard to the mouth of the Anadyr, from the situation of two islands that he mentions, and from the circumstance of the natives that he met there having pierced lips, in which they wore a variety of ornaments made of walrus teeth, it is evident that Deshnew can have been speaking only of the eastern extremity of Asia; and that he must really have sailed through the strait which, eighty years later, was attained by Behring, who has enjoyed the honour of having been the first to discover this strait, and thereby to solve the question of the separation of Asia from America.

The Svätoi Noss of Deshnew is no other than what is now known as the Chelagskoi Noss, the first cape of any importance eastward from the Kolyma.

Burney, always seeking to support his favourite opinion of a connection between Asia and America, by an isthmus situated somewhere near Cape Chelagskoi, has recourse to many suggestions and suppositions; among others, that Deshnew did

not sail in a kotscha, but in a Shittik,* which he supposes capable of being taken asunder and put together again with great facility. Upon this he grounds his belief, that Deshnew did not sail *round* Svätoi Noss, but that he took his vessels to pieces, and conveyed them *over the isthmus*. In support of this belief, he cites the voyage of Taras Staduchin, who sailed eastward from the mouth of the Kolyma, and, finding it impossible to double the Great Tchukotsky Noss, left his vessel, and proceeded by land across a narrow isthmus, to the other side of the cape.†

As it has now been distinctly ascertained, that the whole of the northern and north-eastern coast of Siberia is surrounded by the sea, there is no longer any ground for withholding from the Cos-

* *Shittik* is the Siberian name of a kind of open fishing boat, formed by hollowing out the trunk of a tree, with a bulwark of boards on each side fastened together by a kind of basket-work of willow twigs. The hollowing of the tree, and the preparing of the twigs, which must be soaked in hot water before they can obtain the requisite flexibility, demand considerable time and labour. In Deshnew's days the shittiki were clumsy vessels of about five fathom in length and two in breadth, with a deck and mast, but without a keel. They were caulked with moss, their cordage was thongs of elk leather, and their sails were made of rein-deer skins; their anchor usually consisted of the knotty root of a tree, weighted by a large stone fastened to it. Burney is at all events mistaken when he says of the shittiki, page 69, "It was customary to construct vessels in a manner that admitted of their being with ease taken to pieces, by which means they could be carried across the ice to the edge, and there be put together again."

† The geographical knowledge we have since obtained of the country of the Tchuktches makes it highly probable that Staduchin's progress was prevented by fixed ice, and that he crossed near the spot where Koliutchin Bay runs inland so far that it approaches the south-eastern coast of the Tchuktches-land, and thus forms a kind of isthmus that connects the hilly peninsula with the rest of the country.

sack Deshnew, the honour of having been the first who succeeded in sailing from the Kolyma River, through the Polar into the Pacific Ocean, as far as the Anadyr River; there is the less reason to doubt it, since he had it in contemplation, as we shall see hereafter, to return also by the same way. After this slight digression, we return to the adventures of Deshnew and his companions.

The crew of Ankudinow's vessel, wrecked on the eastern point of Asia, was divided between the two that remained. On the 20th of September, (1648,) they had a battle with the Tchuktches, in which Fedot Alexeiew, the second in command, was wounded. Shortly afterwards, the other vessel was separated from Deshnew's by a violent storm, and never joined company again. Deshnew's was driven about by contrary winds till the end of October, when it was cast ashore considerably to the south of the Anadyr, and probably somewhere about Oliuitorskaïa Bay. We shall see by-and-bye what became of Alexeiew and his companions.

As soon as Deshnew was convinced of the impossibility of getting his vessel afloat again, he resolved to set out on foot with his twenty-five companions, in search of the Anadyr. Unacquainted with the country, without a guide, the adventurous party succeeded, nevertheless, after a severe and painful march of ten weeks, in reaching the mouth of the Anadyr; but truly wretched was their condition in the barren uninhabited wilderness, unprovided with food, or the necessary apparatus for fishing. It was resolved to send twelve of the party up the river, in the hope of its proving a more wooded country, where they might

find game. After wandering twenty days, without discovering any trace of population, or finding food, except the bark of trees and a few roots, and after nearly half had perished of hunger and exhaustion, the few survivors returned disconsolately to their companions.

How Deshnew spent the winter it is difficult to infer from the scanty accounts he has left us. He states, however, that in the summer of 1649, he ascended the river in boats,* with the twenty remaining men, and discovered a tribe called Anauli. With these people he remained a considerable time, and induced them to pay him a yassak: but as they afterwards refused to continue it, and manifested a refractory and hostile disposition, they were all put to death.

In the same year, Deshnew laid the foundation of what was afterwards called the Anadyr Fort, (Anadyrskoi Ostrog,) originally, no doubt, intended merely for a winter station, as it was always his wish to return to the Kolyma, or at least to send some account of himself thither, as soon as possible.

During the interval, efforts had been made at Kolymsk to obtain more precise knowledge of the existence and geographical portion of the river Pogytsha, respecting which the first imperfect accounts had been furnished by Michael Staduchin. It was now ascertained that this river could be no other than the Anadyr, its mouth therefore was not to be sought on the northern coast of the Tchuktche land. It was also learnt, that the

* They had probably, during the winter, constructed a couple of boats of drift-wood, which is found in great abundance along the coast of Siberia, more particularly near the mouths of the large rivers.

shortest way to the river was across a chain of mountains. These particulars were chiefly obtained from some captive Chodynzi, a tribe on the Upper Aniui subdued by the Cossacks in 1650, who offered to act as guides.

A company of Cossacks and fur-hunters was soon formed, who obtained permission to proceed to the Anadyr and to reduce the tribes residing there to a tributary condition. In March, 1650, the expedition set off under the command of Semen Motóra, accompanied by a Chodynzi chief, and, after a journey of four weeks, discovered Deshnew and his companions on the Anadyr, to the mutual joy of both parties. This expedition was soon followed by a second, under Michael Staduchin, who took a different road, so that he did not find Deshnew's winter settlement, but reached the Anadyr after a march of seven weeks, and carried on his operations independently; Deshnew and Motóra, being acquainted with Staduchin's jealous and restless character, determined to avoid him, and with that view proceeded to the river Penshena. In this, however, they were anticipated. Staduchin and his people arrived there before them, but they probably perished there, as nothing further was ever heard of them.

Deshnew and Motóra now built vessels for further discoveries. About the end of 1650 Motóra was killed in a combat with the Anauli. In the summer of 1651, Deshnew went down the river in his new-built vessels, and discovered a large sand-bank, (called Korga in the Siberian language), north of the mouth of the Anadyr, on which were found great numbers of walruses. He collected an abundant cargo of the teeth of these

animals, with which he returned to the settlement, well satisfied with the result of his expedition.

In the following year (1652), Deshnew began to build a large kotscha, in which he intended to send the tribute he had collected from the different tribes to Iakutsk *by sea*. He prepared a sufficient quantity of wood, but could not complete the vessel for want of iron and other necessary articles. Being also informed by the natives that the sea along the coast of the Tchuktche-land was not always so free from ice as he had found it in 1648, he abandoned the plan of returning by sea, but paid a second visit in 1653 to the Korga. In this voyage he was accompanied by Juschka Seliwerstow, a Cossack, who had lately arrived from Iakutsk, with orders to carry on the walrus-fishery on government account. Seliwerstow claimed the first discovery of this bank, which he stated he had seen and known in 1649, in Staduchin's first voyage; but Deshnew insisted, and no doubt justly, on his own right of discovery. This led to a tedious dispute between them, to which we are indebted for the preservation of what we know of Deshnew's memorable voyage; for in support of his claim, he forwarded to the authorities at Iakutsk several explanatory reports, from which Müller obtained a variety of details, having found the original documents in 1736 in the archives of Iakutsk.

On the occasion of this visit to Korga, Deshnew directed his course along the coast, where, seeing some Koriak huts, he landed to obtain information. Here he was informed by an Iakut woman, who had accompanied Alexeiew on his voyage, that the vessel had been driven on

shore; that Alexeiew and one of his companions had died of the scurvy; that the greater number of the remainder had been killed by the natives; and that the others had escaped in boats, but whither they had gone, and what had become of them, she was unable to say. In the sequel, it was ascertained that they reached the Kamtschatka river, where they lived for some time on good terms with the Kamtschatdales, but in consequence of some misunderstanding, were at length put to death by their hosts and the neighbouring Koriaks.

From the year 1654 we completely lose sight of Deshnew, who, during six years, had pursued his object with unexampled activity and perseverance, overcoming all the difficulties which hunger, the climate, and the inhabitants placed in his way. Müller, who had access to the archives, appears to have obtained no information whatsoever respecting the fate of this remarkable man.

To give some idea of the hardships and dangers to which in those days the navigators of the Polar Sea exposed themselves, I will here give a short account of the expedition of Buldakow, taken from the *Sibirskoi Vestnik* of 1821, having corrected the date on Müller's authority.

In the year 1649, the Cossack Timofei Buldakow was sent on public duty from Iakutsk to the Kolyma. He wintered at Jigansk, arrived on the 2nd of June, 1650, at the mouth of the Lena, and attempted to put to sea, but a continuation of north-east winds had brought in so much ice, that he had to wait a month before he could get away. He then sailed, without much difficulty, as far as Omoloi Bay, where he met a great quantity of ice, amongst which his vessel was

driven about for eight days, and so much injured, that he was obliged to land on one of the islands opposite the mouth of the Lena, which cost him two days of arduous labour.

After six days spent in repairing his vessel, he thought he observed, that, notwithstanding the variable winds, the sea had become clearer of ice, and he therefore determined to sail again to Omoloi Bay, where he became again entangled in the ice, and with great difficulty and danger effected a return to the Lena. Here he found eight other vessels, the property of private individuals, Cossacks and fur-hunters, who were waiting for a favourable opportunity to put to sea. They associated themselves with Buldakow, and as soon as circumstances permitted sailed in company to Omoloi Bay. They fell in with much ice on their way, but succeeded in reaching the Bay. There they found the usual passage between the shore and an island completely blocked up with ice, of which many masses had grounded. There being no other channel, they were obliged to cut a passage through. In the bay, they found four more vessels, from the Kolyma,* bound for the Indigirka.

On the following day a favourable wind arose, which brought the little fleet in safety to the mouth of the Iana, where they were again detained, endangered by the ice, and owed their safety to the shallow water along the coast, which prevented the larger masses from approaching them. Availing themselves of this protection they got round the Svätoi Noss in safety. This cape had from the earliest period been deemed one of

* So in the original; it should probably be the Lena instead of the Kolyma.—TRANS.

the most difficult and dangerous points in the navigation of these seas, and, on this account, had received the name of Svätoi, or the Sacred Promontory, from the awe with which it inspired all who approached it.*

Another day brought Buldakow to Kromskaïa Bay, which was filled with drift-ice, making further progress extremely difficult; the more so as the night frosts had already set in. On the 30th of August the whole surface of the ocean was frozen over, as far as the eye could reach. Some of the vessels lay close to the shore, and Buldakow was in hopes the ice would be strong enough to allow him to get his lading on shore. He made the attempt, but on the 1st of September a violent land wind arose, broke up the ice, and the vessels drove with it for five days, always in great danger. The storm was followed by a severe frost; as soon as the ice was thick enough for the men to venture upon it with loads, Buldakow sent some of the crew to ascertain the direction of the nearest land. On their return, and whilst preparing their loads, the ice again broke up, and a violent land-wind again drove them before it for five days more. On its subsiding they were frozen in, but out of sight of land. The men, exhausted and dispirited by the hardships they had endured, now adopted the desperate resolution of setting out on foot for the shore, taking with them only so much provisions and other necessaries as they could draw after them on sledges. This was carried into execution, but with difficulty, as the ice again began to break up; they saw the vessels

* A similar motive may have induced Deshnew to give the same name to the Chelagskoi Noss.

they had quitted crushed by it one by one, and totally wrecked.

Worn out by hunger, cold, and sickness, they at length reached the coast, not far from the mouth of the Indigirka; but even then their sufferings were not at an end, for they had still a long and dreary journey to reach the winter settlement of Uïandinsk. How many perished is not known, but only a small proportion of the party ever returned.

In 1652, two years after this disastrous expedition, the Cossack Rebrow was sent from Iakutsk, to take the command of the Kolymsk Ostrog, with instructions to make inquiries respecting the large island, which is mentioned in Staduchin's report. It would appear, however, that Rebrow obtained no information, for Müller says, that in the archives of Iakutsk he found no subsequent document, referring to Staduchin's supposed discovery, of an earlier date than 1710, about which time the attention of the government was again directed to the subject; and from the different accounts of the Cossack, who had navigated the Sea of Kamtschatka and the Polar Ocean, a kind of general statement was drawn up, full of inaccuracies and contradictions, and displaying an entire ignorance of the geographical position of the several coasts and seas. The most important points of this statement are the following:—

Somewhere between 1661 and 1678, the Cossack Nikifor Malgin, accompanied by the merchant Voropaiew, went by sea from the Lena to Kolymsk. As far as the Swätoi Noss, they kept close to the shore, but there the ice forced them to stand further out to sea. During this voyage, the ship-master, Rodion Michaïlow, pointed out

to them an island on this side of the mouth of the Kolyma, which, though at a great distance, could be clearly seen by all on board. On their arrival at Kolymsk, a merchant of the place, Jakow Wätka, told Malgin, he had once, during a voyage from the Kolyma to the Lena, been driven with three of his vessels to this island, where he sent some of his men on shore: it was entirely uninhabited, and they had found nothing but the traces of unknown animals.

Michael Nasset, (who mentioned at the same time a land he had seen in 1702, from the southern extremity of the mouth of the Kamtschatka river,) reported that during a voyage from the Kolyma to the Indigirka, he had seen land out at sea, and that the ship-master assured him, it was connected with the land opposite to Kamtschatka, and that it extended far towards the mouth of the Lena.

In 1710, the Chancery of Iakutsk received a written report from the Cossack-elder, Jakow Permäkow, residing near the mouth of the Iana, declaring, that during a voyage from the Lena to Kolymsk, he had seen an island opposite Svätoi Noss, and another opposite the mouth of the Kolyma. The mountains on the latter were visible from the main land.

The island seen by Malgin and Wätka, is one of the Bear Islands, probably Krestowoi. Michael Nassetkin describes quite accurately the first of the Kurile Islands, and the first of the Bear Isles. The assertion of the ship-master is completely absurd. Permäkow's report, no doubt, refers to the first Liakhow Island, and to Krestowoi Island.

These, and other accounts, excited in the Vay-

vode of Iakutsk, Trauernicht, the wish to institute a more accurate examination; and having received authority from the Governor of Siberia, in 1711, he fitted out two expeditions, one destined for Kolymsk, the other for the Iana. Both were commissioned to explore the Polar Sea, in winter or summer, according as circumstances permitted, until the existence and real position of the islands, or of the new land, should be fully ascertained.

The first expedition, under the command of the Cossack Mercurius Wagin, consisted of eleven Cossacks, and set out from Iakutsk in the autumn of 1711, for the fort of Ustiansk, at the mouth of the Iana. In the ensuing May, they departed thence, accompanied by the above-mentioned Jakow Permäkow, in *narti* (light narrow sledges drawn by dogs) in which they proceeded along the coast as far as the Svätoi Noss, and thence in a due northerly direction, till they arrived at an island, on which there were no trees, and from nine to twelve days' journey in circumference. From thence they saw another island, but owing to the advanced season, and to the want of provisions, they were not able to venture to it; they determined, therefore, to return to the continent, and to lay in a large stock of fish during the summer, by way of preparing for a second journey over the ice in the course of the ensuing winter. They reached the shore between the Svätoi Noss, and the river Chromoi, at the point where the Cossack Kataïew, of Iakutsk, had formerly erected a cross, and which since then has always gone by the name of Kataïew Krest. Wagin's intention was to go into the interior towards the river Chromoi, to spend the summer there, and diligently to pursue the fishery and the chace. On

their way, however, they consumed all their provisions, and were obliged to kill their dogs. When these had been eaten, they fed on mice, till hunger forced them to return to the coast, where they subsisted during the summer, on eggs, fish, wild geese, and ducks. The hardships they had endured, and the fear that the journey over the ice to the second island, might be attended by even greater difficulties, led the men to adopt the horrible resolution of releasing themselves from their engagement, by the murder of their leaders. Wagin and his son, Permäkow and a fur-hunter, were accordingly put to death, and the men returned to Ustiansk, where they announced that their four chiefs had died of sickness during the journey. It was a long time before the crime was discovered, and on their trial, Wagin's discovery first became known, and though Müller questions its truth, there is really no ground for doubting it. The situation of the first Liakhow Island agrees exactly with the description, whence the identity of the two may fairly be inferred. Its size was probably exaggerated, from a desire to increase the importance of the discovery.

The second division of this expedition was to have consisted of fifty men, who were to have sailed in two kotschy. When these were ready, only twenty-two men could be mustered, who set out in a very indifferent shittik, under the command of the Cossack Wassily Staduchin. From his written report, of the 28th of July, 1712, it appears, that eastward from the Kolyma, he saw a promontory extending a considerable distance into the sea, surrounded by impenetrable masses of ice. This was, no doubt, Cape Chelagskoi, to which his predecessors had given the name of

Svätoi Noss. He makes no mention of any island, although they were driven by a storm very far out to sea.

In the year 1714, two similar expeditions were undertaken by the Cossacks Alexis Markow and Gregory Krugläkow. The former was to sail from the Iana, the latter from the Kolyma; and they were authorized, if they deemed it expedient, to build themselves kotschy, instead of the shittiki with which they had been furnished. An experienced seaman was attached to each division, Prince Gagarin having sent a number of sailors to Iakutsk, to be employed in a great maritime expedition, about to be undertaken from Ochozk.

Markow's report, dated the 2nd of February, 1715, written from the winter settlement of Ustiansk, declares the Svätoie Móre or Holy Sea, to be covered winter and summer by fixed ice, so that it could not be navigable by ships, but was practicable only to sledges, or narti. He undertook such an excursion on the 15th of March of the same year, and returned to Ustiansk on the 3rd of April. The substance of his report is to this effect:—He drove at as rapid a pace as the strength of his dogs would allow, due north, for seven days, without seeing land. He could not proceed further on account of high piled up masses of ice, some of which, however, he ascended, but without seeing land. The want of provisions, particularly for the dogs, many of whom died of hunger, obliged him to return. He was absent seventeen days, and as he always drove with the same dogs, he cannot have gone more than 680 wersts, or about 350 wersts on the journey out. If, however, he had really proceeded so far in a due northerly direction, he must have

arrived at the island of Stolbowoi, which is only 300 wersts north of Ustiansk. He must, therefore, have deviated from his course, which is the more likely to have happened, as the Cossacks in those days possessed only very insufficient means for guiding themselves in their excursions over the Polar Sea.

Krugläkow's expedition appears to have been equally unsatisfactory.

All these unsuccessful undertakings seem for a time to have cooled the zeal of the Cossacks. Nine years afterwards, however, in 1723, Fedot Amossow, the son of a Boyard, revived the assertion of the existence of a large island in the Polar Sea, stretching from the Iana to beyond the Indigirka. He offered to go there, and to subject the tribes dwelling there, to the Russian crown. He was provided with the necessary men and means. Instead however of commencing his investigation from the mouth of the Iana or Indigirka, as he at first intended, he went to Kolymsk, whence he sailed on the 14th of July, 1724, but was obliged, on account of the quantity of drift-ice, to return without effecting anything.

Ivan Wilegin, a fur-hunter, had, in the mean time, related, in confirmation of the report of the supposed island, that in November, 1720, he had gone in narti with another fur-hunter from the mouth of the Tschukotsch river, and had actually reached the land in question, but that dense fogs and snow storms had made it impossible for them to examine the coast, so that he could not even ascertain whether the land was an island or a continent, inhabited or uninhabited, or whether trees grew there. He asserted, however, that he had seen remains of yourtes, but could not tell

to what race of people they might have belonged. A Chelag of the name of Kopai, who lived upon the coast, declared that the land in question extended from opposite the Kolyma to beyond the Svätoi Noss, and that towards the east it reached to the dwelling-places of the Chelagi, a tribe of the Tchuktches. Wilegin thought it would be impossible to reach it by sailing from the Kolyma or Indigirka, there being always so much drift-ice at the entrance of those rivers, but that if the attempt were to be successful it must be undertaken from the part of the coast inhabited by the Chelagi, where the sea was in general much more free from ice.

Proceeding upon this notion, Amossow sailed along the coast to the point indicated by Wilegin, and on the 7th of August arrived at Kopaï's settlement. There, however, the sea was still so thickly covered with ice, that he feared to venture to any distance from the coast, and it was only with much difficulty and danger that he was able to effect his return. In the following winter he determined on a third attempt. Concerning this expedition he writes to the Vayvode of Iakutsk as follows: "On the 3rd of November, 1724, I started from Nijnei Kolymsk with narti, and arrived at some land or island, whence I returned to Nijnei Kolymsk on the 23rd of the same month. On the coast of this land I found a few ruined yourtes, but cannot say to what nation the inhabitants may have belonged, or what may have become of them. The want of provisions, particularly for the dogs, did not allow us to extend our researches into the interior of the country. The way over the ice was attended with many difficulties, partly on account of the precipitous masses of ice on

every side of us, and partly on account of the sea-salt, that had been deposited on the ice in many places, and proved very injurious to the feet of our dogs."*

That Amossow's discovery is the same as Wilegin's cannot admit of a doubt. They both reached Krestowoi, the first of the Bear Isles, which is visible from the continent; its existence had been previously known, and it had been visited by several fur-hunters. As Wilegin, however, was not aware of its being only a small island, and had heard of a large country (the first Liakhow Island) situated opposite the mouth of the Iana, he took the whole to be one large connected country, to which, on the authority of the Chelag Kopai, he assigned even a larger extent.

From all these contradictory accounts it may be perceived how imperfectly, in the beginning of the 18th century, the northern shore of Siberia was known; and the maps were equally incorrect. The only map of that time that deserves any consideration is that of Schestakow, a colonel of Cossacks, who in 1726 travelled from the north-east of Siberia to St. Petersburgh, where his map was engraved. It was republished in Paris at the suggestion of MM. Delisle and Buache. On this map there is laid down an island entitled Kopai, two days' journey from the continent, opposite the Kolyma and Alasei rivers, and described as inhabited by an independent race of Chelagi. To the north of this island is placed the coast of the "Great Land," distant from it not quite two days' journey. Opposite to the north-

* These accounts have for the most part been borrowed from the "Sibirskoi Vestnik," of 1821, and have been corrected by reference to Muller's work.

eastern extremity of Asia, towards the east, is a large island, which a note describes as "an island opposite the promontory of Anadyr, thickly inhabited, and rich in animals of every description. The inhabitants pay no tribute, and live in complete independence." The northern shore of the Tchuktche-land is described by a nearly straight line, neither Tchaun Bay nor Cape Chelagskoi being marked.

Another map by Ivan Levow, a gentleman of Iakutsk, is mentioned by Müller. On this there are marked two promontories; the north-easternmost (generally called Tchukotsh, or North East Cape) is designated as the Chelagskoi Noss, and the other, lying to the south of the former, as the Anadyrskoi Noss. Between these two capes a large bay is described, with an island "inhabited by Tchuktches." Opposite the Anadyrskoi Noss are laid down two other islands. The one nearest the coast is described thus: "in half a day one can reach this island by water from the coast. By the Tchuktches the inhabitants are called *Achjuchalaety*. This race have a language of their own, and make clothes of duck-skins. They feed on whales and walrusses, and having no wood, they cook their food with train-oil." The same note describes the second island as lying "two days' sail from the shore. The inhabitants, called *Pejekeli* by the Tchuktches, are likewise clad in duck-skins, pierce their cheeks, and stick bones and teeth of animals in them. They dwell in fixed habitations." Beyond these islands is marked an extensive continent, with this note appended: "the inhabitants of this country are called by the Tchuktches, *Kitschin Elaet*. They have a language of their own, wear clothes made

of sable-skins, dwell in mud huts (semlänki), and their arms consist of bows and arrows. In this country there are many animals of which the skins are worn as clothing by the natives. Of trees, the pine, the larch, the fir, and the birch, are met with."

Müller mentions likewise a map prepared at Iakutsk, in which the Chelagskoi Noss is vaguely indicated. Opposite to that part of the coast, a country is marked in the same undefined manner, and said to "be inhabited by a nation called the *Kikikmi*, who bear a strong resemblance to the Iukahirs." At Cape Chelagskoi there is this note: "the natives have a language of their own. They are brave and cruel in battle, so that it is impossible to master them; nay, if one of them happen to be taken prisoner, he always kills himself."

These vague and inaccurate descriptions, however, are not confined to the maps drawn by the unscientific inhabitants of Iakutsk. Even on Behring's map, drawn by himself in 1728, on his return from his first voyage to the eastern coast of the Tchuktche-land, the Chelagskoi Noss is in the same way confounded with the eastern extremity of Asia, and with the Tchukotskoi Noss. Many of these inaccuracies originate in the ignorance of the authors of these maps concerning the achievements of Deshnew, respecting which it was not till 1736 that Müller brought to light any definite account, having discovered it in the archives of Iakutsk. The "Great Land," as it is called, beyond the islands at Anadyrskoie Noss, is no doubt the north-west coast of America, upon the existence of which probably rested the whole tradition of the land supposed to lie oppo-

site to the Chelagskoi Noss. This is confirmed by a report of the Cossack Popow, who in 1711, travelled from the Anadyrsk Ostrog to Tschukotsky Noss. "Opposite the promontory," he says, "may be seen extending on both sides, in the direction both of the Kolyma and the Anadyr, an island called by the Tchuktches the Great Land. The inhabitants pierce their cheeks, and stick in bones," &c. Now, it cannot be doubted that Popow is here speaking of the American shore, which does lie nearly opposite Tchukotsky Noss, and stretches away both to the north and south; for under the name of Tchukotsky Noss, Popow understands the eastern part of the peninsula.

With the year 1734 commence the travels undertaken by men of scientific acquirements, who have corrected the earlier maps, and have furnished more authentic accounts of the country.

The first of these expeditions took place during the reign of the Empress Anna. Its object was to obtain a correct knowledge of the northern coast of Siberia, from the White Sea to Behring Straits, and to ascertain whether it were possible to go by sea from Archangel to Kamtschatka, by sailing in an easterly direction. For this purpose the Admiralty resolved to fit out three separate expeditions. One, consisting of two vessels, was to sail from Archangel eastward to the mouth of the Obi. Another from the Obi to the mouth of the Ienissei. The third was to sail from the Lena, and consisted of two vessels, one of which, was to sail westward to the Ienissei, and the other eastward, past the Kolyma, to Behring Straits.

The selection and equipment of the vessels that were to form the first expedition, were intrusted

to the officer in command of the Harbour of Archangel, who by the advice of several experienced mariners, caused two kotschy to be built, each fifty-two and a half feet in length, fourteen feet broad, and eight feet deep, named the *Obi* and the *Expedition*. Each had a crew of twenty men, and was commanded by an officer of the navy. These two officers were Lieutenants Pawlow and Muraview.

Both vessels sailed from Archangel on the 4th of July, 1734, and before the end of the summer got as far as the Mutnoi Saliw (or Muddy Bay), in the Sea of Karskoie, whence they returned to the mouth of the Petchora, to spend the winter. In the month of June they put to sea again, but got very little further than in the preceding year, and returned again to the Petchora for the winter. As Muraview attributed the failure of the expedition to the nature of the vessels employed, which he declared were altogether unfit for the service, the Admiralty ordered two decked boats of between fifty and sixty feet in length to be built, which were sent under the command of Lieutenants Skuratow and Suchotin, to join the expenition of Muraview, who, in the mean time had been recalled, and the command given to Lieutenant Malygin.

This officer descended the river on the 27th of May, 1736, with the expedition, intending to put to sea, but he had scarcely got out of the Petchora, when his vessel was surrounded and completely destroyed by drift-ice; and it was not without the greatest difficulty that he was able to save the stores and the lives of the crew. Nevertheless, he put to sea again on the 17th of June, with his remaining vessel; again encountered immense

masses of ice, and after having struggled with an infinity of dangers, was forced to remain stationary at the Isle of Dolgoi, where, on the 7th of August, he was joined by the two-decked boats that had been sent to him from Archangel. Malygin immediately took command of one himself, gave the command of the other to Skuratow, and sent Suchotin back to Archangel with the Obi, which arrived there in safety. The two decked boats then proceeded on to the Kara River, where they wintered.

In July and August of the same year, (1736), the Geodet Selifontow had been with rein-deer to examine the western coast of the Gulf of Obi, and had proceeded in a boat to the island of Beloie, the southern shore of which he surveyed. In November he joined Lieutenant Malygin. The following year, accompanied by some Samoïedes, he undertook another excursion over the ice, to continue the survey of the continent, and that of the island of Beloie.

In May, 1737, Malygin and Skuratow prepared to renew their operations. The ice in the Kara broke up in the beginning of June; but as they were aware that the sea would not be sufficiently free to be navigable till towards the middle of July, they resolved to remain in the Kara till the 1st of July. During the interval, symptoms of scurvy began to manifest themselves among the men, but by the use of some antiscorbutic herbs that were found in the vicinity, the evil was soon arrested.

On the 3rd of July the two vessels were at the mouth of the Kara; and though there was still much floating ice, they put to sea, and endeavoured to sail, as much as possible, in a northerly direc-

tion. On the 23rd of July they saw the island of Beloie,* and anchored on the following day in the Strait that divides the island from the continent, and to which the latitude of 73° 8′ was assigned. The flood-tide lasted only four hours, and came from the west; the ebb-tide flowed from the east, and lasted eight hours. The former brought salt, the latter fresh water; and the current was very much stronger during the ebb than during the flood. The water rose a foot and a half.

The Strait is encumbered by a variety of shoals, between which several opposing currents are formed. Malygin was detained in the Strait twenty-five days by contrary winds, so that (according to Müller's account) he was not able to get out before the 18th of August. He doubled a Cape denominated Jalmal by the Samoïedes, reached the Gulf of Obi, and on the 11th of September entered the Obi River, which he ascended as far as the Soswa, where he laid his vessels up for the winter, and quartered his men in the village of Beresow, after which he set off by land for St. Petersburg. The command of the expedition devolved on Lieutenant Skuratow, and the Mate Golowin, who set out in 1738, and after many dangers and hardships, returned to the Dwina on the 11th of August, 1739.

The equipment of the two other expeditions, destined to survey the coast eastward from the Obi, was intrusted to the celebrated Commodore Behring. He caused a double sloop to be built at Tobolsk, and called it the *Tobol*. It was seventy feet long, fifteen broad, and eight deep; carried

* Upon the more modern maps this island is called Tchast.—Tr.

two masts, and was armed with eight two-pound falconets. The crew was composed of fifty-three seamen, a mate, a geodet, and a priest. The command was given to Lieutenant Owzyn, who received his instructions from the Admiralty through Commodore Behring.*

On the 15th of May, 1734, Owzyn set out, accompanied by several smaller vessels laden with provisions and stores. In nine days he reached the mouth of the Irtish, took in a pilot at Samachowskoi Jam, and then proceeded down the Obi. On the 2nd of June he reached Beresow, took on board a fresh pilot and some seamen, who had been sent there for the purpose of completing his crew. On the 12th of June he was off Obdorskoi Ostrog, the last Russian village on the Obi, and on the 15th of June, at the mouth of the river. Owzyn entered the Gulf of Obi on the 19th, through the most easterly arm of the river, which is the deepest. At the very outset he encountered a violent storm, which damaged his provision-boats so seriously as to render them unfit for further service. From the wood of the one that had suffered most, a store-house was erected on the coast, where the provisions and stores from on board the other boats were deposited. This place, which lies in latitude 66° 36′, was called Semosernoïe (the seven lakes), on account of seven small lakes that were found there.

On the 21st of June this work was completed. The necessary guards were left at the store-house,

* This description of the voyages of Owzyn, Malygin, Prontchichtchew, Laptew, Tcheliuiskin, and Minin, has been drawn up for the most part from the Admiralty Memoirs, 1820, in which, however, I have made many corrections and additions from the original journals.

and Owzyn commenced his voyage, steering along the eastern shore of the Gulf of Obi. On the 26th he sent off in boats a Cossack non-commissioned officer, with seven seamen, to erect landmarks at the entrance of the Gulf, and to receive the vessels that were expected from Archangel. He continued his own voyage northward, but his progress was extremely slow, owing partly to contrary winds, and partly to the many shoals, between which he found it difficult to obtain the necessary depth of water for his vessel. On the 6th of August he reached 70° 4′ N., where the severe frost, that was already setting in, made it impossible to proceed further for that year. This induced Owzyn to return and winter at Obdorskoi Ostrog, where he arrived on the 4th of September. On the 13th of October the Obi was completely covered with ice.

The shores of the Obi Gulf consist chiefly of naked tundras, the soil of which is always frozen, not, even in the middle of summer, thawing beyond thirteen inches in depth. Vegetation is scanty in the extreme. Of animals there were seen large numbers of rein-deer, and a few bears. Very few fish were found in the Gulf, and only once were *hausen* met with.* There were some wandering tribes of Samoïedes on the icy plains, with whom Owzyn frequently held communication. In November some rein-deer Samoïedes arrived at the Ostrog from the west, with the yassak or yearly tribute. These men related that, during the preceding summer, they had seen Russians on the coast, not far from the Kara River,

* This fish was, probably, the *Delphinus leucus*, which, along the coast of the Polar Ocean, is known by the name of *Beluga*, or, more correctly, *Beluchha*.

who had come with rein-deer from Pustosersk, to erect land-marks along the shore. With these Samoïedes, on their return, Owzyn sent two Cossacks to Pustosersk, to inform Lieutenant Muraview of his navigation of the Gulf of Obi, and of the land-marks that had been erected there.

In spring, 1735, Owzyn descended the Obi on the 29th of May. The ice floating down the river, obliged him several times to seek shelter in the creeks along the shore. On the 6th of June he arrived at the magazine he had erected the preceding year, where he received on board the stores laid up there, and proceeded further on the 11th. It was not long before he found himself impeded by the ice which was accumulated at the mouth of the river, that in the Gulf not having yet broken up. It was not before the 20th of June that the navigation became practicable. In the mean time, scurvy had manifested itself among the crew, and had increased to such a degree, that of fifty-three men, only seventeen continued in health. Owzyn himself was one of the sufferers. The unhealthy state of his crew induced him, after consulting with his officers, to renounce the expedition for that year, and to return to Tobolsk, that his men might be restored to health during the winter, by good food and medical assistance. His ship likewise was in want of repair. He accordingly began to ascend the river on the 18th of July; but though, on his demand, supplies of men were furnished him at Obdorsk and Beresow, still the voyage against the current went on but slowly, and it was only on the 6th of October that he reached Tobolsk. A few days after his arrival there, the Irtysch was covered with ice.

In December, Owzyn was sufficiently recovered to undertake a journey to St. Petersburgh, to make a personal report to the Admiralty, and to explain the reasons why it had hitherto been impossible for him to perform the task assigned to him. He also suggested several measures which he deemed necessary to the success of his undertaking; among other things, he advised that a second vessel should be allowed him, partly that the two might be ready to afford one another assistance, when necessary; partly, that they might be able to make corresponding observations. He also proposed, that in spring, a geodet should be despatched with sledges, to survey the coast by land, as far as the mouth of the Ienissei. All his suggestions were approved, and he received orders for the construction of a vessel, in which the Mate Koschelew was to accompany him.

On the 24th of February, 1736, Owzyn and Koslew arrived in Tobolsk, and immediately commenced the construction of a new vessel, of sixty feet long, seventeen broad, and seven and a half deep. Notwithstanding all their exertions, however, it could not be got ready for the summer, and Owzyn determined to set off on his third voyage to the Polar Ocean in his old ship. As before, he was accompanied by some small transports, laden with provisions, &c. On the 14th of June he arrived at Beresow, where he was detained, by various causes, for nine days. On the 7th of July, he reached the mouth of the Obi, left his store-ships at the magazine of Semosernoïe, and sailed in a northerly direction down the Gulf. On the 28th, he found himself at the point whence he had returned in 1734, and on the 5th of August, in 72° 34′ N., he came to the edge of the

solid ice, which had not broken up since the winter, and extended the whole way across the Gulf. After many fruitless attempts to find a passage into the ocean, and after it had been ascertained by repeated examinations of the ice, that there was no prospect of open water for that year, Owzyn, having consulted his companions, determined to return, and to winter at Obdorsk, where he arrived on the 26th of September, only a few days before the Obi was covered with ice.

In December, the Samoïedes, according to their custom, arrived with their yassak; and with their returning caravan, in pursuance of Owzyn's proposal, a geodet was sent off to survey the coast of the Polar Ocean.

On the 5th of May, 1737, the second vessel was ready to leave Tobolsk, and on the 5th of June, she arrived at Obdorsk, with her builder Koschelew, and the mate Minin, just as Ozwyn was preparing for his fourth voyage. He took the command of the new vessel, placed the old one under Koschelow, and both set sail on the 29th of June. After a short stay at Semosernoïe, they entered the Gulf on the 14th of July, but their progress was extremely slow, owing to thick fogs and contrary winds. On the 6th of August, they were in 76° 46′ N., on the eastern shore of the Gulf, where they discovered a bay extending in a south-easterly direction, 160 wersts inland. This bay is called Gidijam by the natives, and receives the waters of a river of the same name.

As it was getting late in the year, Owzyn did not deem it prudent to spend more time on the examination of this bay, but returned without delay to its entrance, in 72° 40′ latitude. Here

he found the flood-tide running for six hours to the south-west, and the ebb towards the north-east. On the 8th of August, they left the Gulf and entered the Polar Ocean, proceeding northward, with a favourable wind, till they reached 73° 56′ N. There, however, they met with ice piled up in huge masses, and covered with countless flocks of birds. The depth of water was fifteen fathoms, and a current to the west at the rate of three-fourths of a mile an hour. There also they saw a whale. They then sailed on the land-side of the packed ice, in a S.E. by S. course, in which direction the sea appeared to be free from ice.

On the 9th of August, land was seen to the E.N.E. The lead showed seven, six, and five fathoms, with a hard bottom of grey sand. On the 10th, they were opposite a low flat coast, and anchored at the distance of half-a-mile from it, in two fathoms and a-half water. The latitude of the anchoring-place was 73° 10′; the variation was half a point east.

The mate Minin, who was sent on shore in a boat, reported that the coast was low and flat, and ran in a north-east direction. On several points, washed by the sea, a large quantity of drift-wood was found. At some distance inland were six lakes, connected with each other by a river that fell into the sea. In these waters were immense flocks of wild ducks, geese, and gulls. The land was barren—a few rein-deer and a white bear were seen at a distance. From hence they beat to windward for six days, always anchoring at night. On the 16th they were in 73° 18′ N. The north-east cape, called by the Samoïedes Mate-Sol (the Blunt Point), bore E.S.E., distance three

and a-half miles. On this cape Owzyn erected a monument of drift-wood, with an inscription stating that, "on the 17th of August, 1737, he, with two vessels, had sailed past that point towards the east, arriving from the Gulf of Obi."

On the 17th, they saw a quantity of drift-wood floating towards the south. The depth of water was very unequal, and large sand-banks extended to a great distance from the shore. Behind Cape Mate-Sol was found an inlet twenty miles broad, stretching more than 100 wersts inland. Thence to the mouth of the Ienissei, a distance of ninety miles, the coast runs in a south-east direction.

On the 1st of September, the two vessels anchored at the entrance of the Ienissei, off a magazine expressly prepared for their reception. By an altitude of the sun, the latitude of the anchoring-place was ascertained to be 71° 33′; the variation was $\frac{3}{4}$ of a point easterly. After the ships had received the necessary supplies from the magazine, they took a pilot on board, from the neighbouring village, Korennoie; and proceeded, on the 2nd of September, up the Ienissei, partly sailing and partly by the aid of a towing-line. They ascended the river for a whole month, and were in hopes of reaching Turuchansk before the winter set in; but were stopped by the ice on the 1st of October for the winter, in a creek about thirty wersts below Turuchansk. Koschelew's vessel wintered at the mouth of the Deneshkina, 100 wersts below Turuchansk. On the 10th of October, the river was completely frozen over.

During the winter of 1738, in consequence of a complaint sent in by one of those under his command, Owzyn was ordered to be tried, and

Koschelew was recalled to St. Petersburg. The command devolved on the mate Minin, who, in the ensuing summer, was ordered to return to the Polar Ocean, and, if possible, to double Cape Taimura.

On examination of the vessels, it was found that the older of the two was unfit for another voyage. Minin determined accordingly to proceed with the other vessel alone; and on the 4th of June, commenced his voyage down the Ienissei, the mouth of which he reached on the 3rd of August, and proceeded eastward along the coast. On the 8th, in latitude 72° 36′, he passed a rocky shore, named Baranow Kamen. On the 9th, in latitude 72° 53′, having fifteen fathoms water, they came to an impenetrable line of ice, which obliged them to return to the wintering village, Wolgino, in latitude 72° 20′. After three days, they renewed their attempts to get to the north, but were stopped by what appeared to them fixed ice; and on the 16th they were obliged to anchor in 73° 8′, in nineteen fathom water, behind an island, situated four wersts from the shore. Minin sent the mate Sterlägow in a boat, to ascertain whether an opening could not be found. After three days' absence, Sterlägow returned, and stated that he had succeeded, with much labour and danger, in proceeding about forty wersts between the coast and the edge of the ice, to a point whence the shore ran in an easterly direction. At a distance of sixteen miles E.N.E. ¼ E., he had seen a promontory, but his stock of provisions being exhausted, he had been forced to return.

Minin remained at his anchoring place, till the 30th of August, when the approach of winter

obliged him to regain the Ienissei, which he reached on the 13th of September, and wintered at a village below Turuchansk.

The following spring (1739), Minin surveyed those parts of the Ienissei not previously laid down. He found that the channel varied from two to eight fathoms in depth. On the 3rd of June, the ice broke up, and he was able to proceed with his ship to Turuchansk, for the purpose of receiving such supplies as he required. There he was detained, by various causes, till the 31st of July, when the lateness of the season made it impossible to get further than the mouth of the river, whence he had to return for the winter.

During the winter (1740), the Mate Sterlägow was sent off with sledges to survey the coast from the mouth of the Ienissei to Taimura. On the 22nd of March, he came to the North-Eastern Islands, in 73° 5′ N., whence he began his survey. At 73° 9′ the variation of the needle was 10° E. At three or four wersts from the shore, he thought there must have been open water, on account of a dense vapour which he saw rising. Sterlägow observed the latitude almost daily. The coast and the neighbouring islands were uniformly rocky. On the 14th of April, in latitude 75° 26′, he erected a mark on a bold, projecting rock. "Here," he says in his journal, "the variation of the needle was so great, and it was so unsteady, that I am inclined to believe the magnet ceases to act in these high latitudes." The reflection of the sun's rays from the snow was so dazzling, that they could scarcely see; and, fearing they might become completely blind, they determined to return. On the way back, they halted at a winter habitation, on the River Pässini, to allow

their exhausted dogs time to recruit their strength; and on the 29th of May they arrived again at Turuchansk.

On the 7th of June, Minin descended the Ienissei, reached the sea on the 4th of August, and sailed northward along the coast. Not far from the North East Islands he encountered a violent storm, and lost his boat. Continuing his voyage he reached the mouth of the Pässina on the 16th, but was not able to enter it, on account of a number of shoals. The bay into which the river falls is protected from the N.W. winds, and has a safe anchorage in four-and-a-half fathom water. A smaller bay, protected by some islands, is in 74° 43′. They continued to run towards the north with a favourable wind. The lead constantly gave from eight to ten fathoms, but suddenly they were unable to obtain soundings. Minin's journal, however, neglects to mention what the length of the line was. On the 21st of August, in latitude 75° 15′, they came to impenetrable ice. This, but more particularly the lateness of the season, obliged them to return. On the 28th of August they reached the Ienissei, which they ascended to the Dudina, and spent the winter, during which season Minin completed the survey of the Ienissei as far as Ienisseisk, and then returned to St. Petersburg.

The sloop Iakutsk was built at the city whence she received her name, at the same time as that with which Owzyn sailed from Tobolsk. The command was intrusted to Lieutenant Prontchichtchew, who was directed to sail from the mouth of the Lena westward towards the Ienissei. A third vessel, called the Iakutsk, commanded by Lieutenant Lassinius, was ordered to sail from

the Lena eastward, and, if possible, to pass through Behring Straits, and to reach Kamtschatka or the mouth of the Anadyr.

Both vessels departed on the 30th of June, 1735, accompanied by several transports with provisions. Their passage down the Lena was unaccompanied by any difficulty. Everywhere they found from four to nine fathoms water. Along the banks of the river, which were richly clothed with larch and birch trees, as well as on the islands, they passed a number of settlements, the inhabitants of which were busily engaged in fishing. The whole presented a cheerful and animated picture. On the 2nd of August they reached the mouth of the Lena, which falls into the ocean through five branches, forming four islands of considerable size. Having got to sea through the most easterly branch, called Bychow, they received on board the stores brought down by the transports, and sent the latter back to Iakutsk.

On the 9th of August the two ships parted company. Lassinius sailed towards the east, but contrary winds detained Prontchichtchew till the 14th, when he succeeded in getting beyond the islands formed by the mouths of the Lena. On the 16th large masses of ice were seen towards the north. On the 26th they anchored in a bay formed by the mouth of the Olenek. Having sent out a boat to examine the channel, they ascended the river on the 30th. Finding some empty summer yourtes, that had been constructed by fur-hunters, Prontchichtchew determined to winter there. On the 20th of September the river was frozen over. The latitude of this place, by obser-

vation, was 72° 54′.* On the 10th of November the sun disappeared below the horizon.

On the return of Spring (1736), Prontchichtchew prepared to resume his voyage. The river was open on the 21st of June, but the ice at the entrance did not break up before the 3rd of August. He got to sea on the following day, and sailed on a N.W. course. On the 5th of August he was at the mouth of the Anabara, where he anchored, and sent the Geodet Tschekin to examine the river. The latter returned at the end of six days, and on the 12th the ship again sailed on a northerly course, and having proceeded thirty-two miles, encountered great quantities of ice. They had to beat to windward till the 13th, when they were constrained to enter the Bay of Chotanga, the entrance to which is thirty miles

* In the Memoirs of the Admiralty this latitude is assumed to be incorrect, and calculating from the period assigned by Prontchichtchew as that at which the sun disappeared, 70° 57′ is assigned as the correct latitude. On this ground, and judging from the latitude of 69° 29′, given by Captain Billings as that of the mouth of the Kolyma, (which differs from the earlier charts of the Polar Ocean by 1° 46′,) the Admiralty Memoirs infer, that "the coast of the Polar Ocean, in the old maps, (those of Prontchichtchew's expedition,) are laid down a degree and a half further north than they ought to be." This is not the fact, as may be seen by the following comparison:—

	°	′
The mouth of the Olenek, according to Prontchichtchew, is in lat.	72	54
according to Lieutenant Anjou,	72	57
The lighthouse, at the entrance to the Kolyma, according to Laptew	70	05
according to Wrangell,	69	35

Lastly, it ought to be remarked, that in these northern latitudes, in winter, and more particularly in spring, the refraction at the horizon is so great and so uncertain, that the usual calculations of latitude, by the disappearance of the heavenly bodies below the horizon, are not at all to be depended on.

broad. In the centre are a couple of islands, one low and flat, the other consisting of tolerably high rocks. Within the bay the soundings varied from nine to twelve fathoms. On the shore they found a hut, in which were dogs and newly-baked bread, the property, probably of some fur-hunter. An altitude of the sun was taken on the 14th of August, and the latitude of the place determined 74° 48′. From this point the mouth of the Chotanga River bore S.W. thirty miles distant. The variation was one and a-half point easterly.

On the 16th the vessel proceeded on her voyage, and on the 17th passed a bay completely covered with ice; the soundings varied from two to fourteen fathoms. Among the ice some islands were seen, but the dense fog covering the whole bay, made it impossible to determine their size. By the ship's reckoning they were distant, on the 17th, 120 miles from the Chotanga, in latitude 76° 20′. During the 18th they continued their course along the edge of the ice, making small progress, the sea being covered with immense masses of floating ice. Within the bay the ice had evidently not broken up during the whole summer. Across the low and flat shore, at a considerable distance inland, high mountains were discerned covered with snow.

Another large bay was passed on the 19th, stretching 20 miles inland, towards the S.E.; two islands about a mile apart were at the entrance. The ice extending from the bay a considerable distance out to sea, obliged them to make a north course, and the vessel was repeatedly in danger of being crushed. At noon they were opposite to a bay, which, on account of its steep and rocky shore, they considered to be the entrance to the

Taimura River. Here they had soundings in ten to thirty-five fathoms. They proceeded westward with great difficulty and danger through the masses of ice, and saw a quantity of hausen (*Delphinus leucus?*) among the islands; this, and the flights of seamews that kept wheeling around them, confirmed them in the belief, that the bay, in front of which they were, must be the entrance to the Taimura;* all their attempts, however, to enter proved fruitless, the bay and river being covered with fixed ice, which according to all appearance never broke up. From the coast, large fields of ice extended a long way into the sea, and on these several white bears were seen.

On the 20th, at midnight, in latitude by reckoning 77° 29′ the ship was suddenly beset on all sides by the ice, and was in momentary danger of being crushed to pieces. The advanced season and the high latitude left them little hope of seeing the ice in front of them break up; and it was resolved to return, that the crew might be able, before the winter set completely in, to reach the Chotanga River, or some other place calculated for a wintering station. A dead calm, accompanied by a severe frost, had the effect, very soon, of covering over all the open places with a thick crust, which had to be broken with bars and poles, in order to open a passage for the vessel.

A strong north wind arose on the 25th, which drove the ship towards the south, together with the ice in which it was beset. The crew began to despair of ever escaping from their perilous

* This conclusion was, nevertheless, incorrect, for the subsequent investigations of Laptew and Tcheliuiskin have shown that the Taimura falls into a bay on the western side of the North Cape of Asia, which Prontchichtchew had not doubled.

position, and would no doubt have perished, if, on the following day, the ice had not been broken up by several successive gusts of wind. This enabled them to reach the entrance of the Chotanga, but they found it completely frozen over, and were obliged to proceed further, in hopes of being able to get into the Olenek, which they were off on the 28th, but contrary winds, and drift-ice, kept them beating about for six days. The crew, exhausted by wet, cold, and incessant labour, were scarcely able to handle the frozen ropes any longer, and as the winter was setting in with increased severity, their position became every day more desperate. Lieutenant Prontchichtchew, himself, who for some time had been too ill to leave his cabin, was so much affected by the sufferings of his companions, that he died on the 30th of August, to the deep regret of the men, by whom he was loved and valued. The command, thereupon, devolved on the mate Tcheliuiskin, who, on the 3rd of September, succeeded in entering the Olenek, where the deceased commander was buried, with all the solemnity which the circumstances allowed. A few days afterwards, Prontchichtchew's young wife, who had accompanied him on this dangerous voyage, died also, and was buried in the same grave with her husband.

The Olenek was completely frozen over on the 28th. Tcheliuiskin and his companions passed a terrible winter, in half subterranean huts, which they erected along the bank of the river, and in July, (1737,) as soon as the ice had broken up, they lost no time in getting to sea again. Convinced, by their experience of the preceding year, of the impossibility of doubling Cape Taimura,

and their vessel having suffered considerably, they resolved to return to the Lena. This they effected with little difficulty; but on their arrival at Iakutsk, Commodore Behring was no longer there, having left for Ochotsk. Tcheliuiskin forwarded to him a written report, and then set off for St. Petersburg, to deliver, in person, to the Admiralty, a full account of Prontchichtchew's expedition.

After a careful examination of the journals and charts, and of Tcheliuiskin himself, the Admiralty refused to recognise the grounds on which it was stated, that the navigation from the Lena to the Ienissei was impracticable. It was, therefore, determined that in the ensuing summer, another attempt should be made to double the northern extremity of Asia, and if the undertaking failed, that the survey of the Cape and coast should be made by land. Tcheliuiskin returned to Iakutsk with these instructions, and delivered them to Lieutenant Chariton Laptew, who had been appointed to the command of the expedition.

Lieutenant Laptew sailed from Iakutsk on the 9th of July, 1739, accompanied, according to custom, by several smaller vessels, laden with two years' supply of provisions. On the 20th he reached the Krestowskoi, one of the arms into which the Lena divides before falling into the sea. On the most prominent point he erected a signal-tower, of drift-wood, seven fathoms in height; he then dismissed the provision-transports, with the exception of one, which he sent to the Olenek, with orders to deposit her cargo there in a magazine. He then proceeded westward, passed the mouth of the Olenek, and another bay to which he gave the name of the Nordvich. In this bay,

which was completely covered with fixed ice, he saw a great quantity of stone-foxes, and also a white bear.

On the 6th of August they reached the Bay of Chotanga, where Laptew intended to deposit a part of his provisions, in order to lighten the vessel. Suddenly a strong north wind set in, and brought with it such an immense quantity of ice, that the vessel was completely beset. In this dangerous position she remained till the 16th, when, the wind changing, the ice was driven out to sea again, and Laptew resumed his course towards the north. On the fields of ice around, quantities of walruses were seen. On the 20th they passed the promontory of St. Faddei, where the ice again drifted down upon them in large masses, and soon afterwards they came to fields of ice, that made all further progress impossible.

Laptew anchored off Cape St. Faddei, in latitude 76° 47′ by reckoning, and sent the Geodet Tchekin on shore, to ascertain how far the land continued to run in a westerly direction. Tcheliuiskin was sent towards the south, to seek for the mouth of the Taimura. In the mean time, six men were ordered to erect a signal-tower on the extreme point of the Cape. While engaged in this work, they found a mammoth's-tusk of considerable size.

Cape St. Faddei, according to Laptew, consists of a steep rock, extending towards the south and west into the bay. The surface is chiefly covered with fragments of white stone, bearing a strong resemblance to gypsum; there is also a strong clay, on which is a scanty coarse moss.

Towards the N.W. was seen a mountainous land, with snow on many of the summits, which

Laptew concluded was the same that Prontchichtchew reached in 1736, and whence he commenced his return. An island was likewise seen, distant ten miles N. by W., which he took to be the last of those surveyed in the preceding year, and to which he gave the name of St. Lawrence.

The Geodet Tchekin returned without having executed any part of his mission, the dense fog, with which the whole coast was covered, making it impossible to distinguish a single object. Tcheliuiskin reported, that he had found nothing bearing any resemblance to the mouth of a river, and that the whole bay, as well as the sea, as far as the eye could reach, was covered with fixed ice, through which it would be impossible to effect a passage. This, and the increasing severity of the frost, induced Laptew, after consulting with those under his command, to return in search of some good wintering-place. After encountering many dangers and hardships among the ice, they reached the Chotanga River, and entered it on the 27th of August. There, in the vicinity of the little river Bludnaia, they found a tribe of stationary Tonguses, with whom Laptew determined to spend the winter. They are called *sidätshi* (sitting) Tonguses, because they do not nomadize, but dwell in fixed huts. They have no reindeer, but use dogs instead, for draft.

As there was not much drift-wood to be found, the men had to collect from a considerable distance the requisite supply of fire-wood for the winter, and were incessantly engaged during their whole stay, in seeking, what in such a place was one of the first necessaries of life, and which they had frequently to carry a distance of many wersts; to this incessant exercise in the open air, they

were, no doubt, chiefly indebted for their total exemption from scurvy, a disease so fatal to travellers in these high latitudes.

On the 23rd of March, 1740, Laptew sent Tchekin with *narti* (sledges drawn by dogs) to the Taimura River, with orders to survey the coast from the mouth of that river to the Pässina. The party was a tolerably large one, for besides the narti furnished by the inhabitants, they were joined by some wandering Tonguses, who resolved to accompany them with a herd of eighteen rein-deer. These all died on the way for want of food, and their late owners came back without them on the 9th of April. Tchekin returned from his expedition on the 17th of May. He had reached the Taimura River, and had followed its course to the point where it fell into the sea. He had then proceeded about 100 wersts westward along the coast, to the point where it trended in a southerly direction. Being without provisions, either for his men or his dogs, he could not continue his survey further.

Laptew, fully convinced of the impossibility, on account of the fixed and impenetrable ice, of sailing round the northern extremity of the Taimaura Bay, resolved to return to the Lena. After two vain attempts to get to sea before the usual period, he succeeded at length, on the 30th of July, with much difficulty and danger, in working his way through the ice. On the 13th of August, however, the vessel was beset by masses of ice. She lost her bowsprit, and what was worse, sprung a dangerous leak. Three days' incessant pumping could not reduce the water in the hold; so to lighten the ship, the guns were thrown overboard, and her stores were landed on the ice. By these

means the vessel was kept afloat for the time, but the situation of the crew continued a most fearful one. They were at a distance from the shore, surrounded by enormous masses of ice, between which they were driven about by wind and current, and every succeeding moment seemed to threaten the total destruction of the vessel. In this situation they continued for six days.

A calm set in on the 19th, accompanied by a frost, which soon covered the open places with a thin crust of ice. Some of the crew volunteered to set off on foot, in search of land, which, it was calculated, must lie about twenty wersts to the south. They started on their dangerous journey, in the course of which they arrived at many places, where they had to ferry themselves across lanes of water, on fragments of ice, but after surmounting innumerable dangers, they reached the coast in safety. The frost continued to increase, and at the end of three days the sea was frozen over the whole of the way. Laptew and his companions hastened to avail themselves of this. They loaded themselves with as much provisions as they could carry, and reached the coast, where, after their first joy at escaping with their lives, they found they had little reason to congratulate themselves. The rivers were still not frozen over, so that they could not cross them to proceed to their wintering-station on the Chotanga. They were, accordingly, forced to remain for a time in this desolate wilderness, where no wood whatsoever was to be found, and entirely without shelter of any kind, except holes dug in the frozen soil. A party was daily sent off to the ship, to bring on shore as much as possible of the provisions that had been left behind. This, however, lasted only

till the 30th of August, when a violent storm broke up the ice, and drove the ship and all their stores out to sea. Thus were the unfortunate men abandoned on this inhospitable coast, unprovided with the most indipensable supplies. Many of them died of cold and hunger, but the courage of the survivors bore up against their misfortunes; they endured with patience and firmness, and continued obedient to their leader, who animated and supported them by his example.

Thus did they pass a dreadful month. At length, on the 21st of September, the rivers were frozen over, and they were able to set off in search of their last year's wintering place. Innumerable were the impediments and hardships which they encountered on the journey. A part of the stores which they had saved were placed on narti, drawn by half-famished dogs, the remainder were carried by the men themselves. Thus they plunged into the wilderness which was entirely unknown to them, and through which they had to wander for five-and-twenty days, making for themselves a path over ice and snow. During this journey, twelve more of the party died of cold and fatigue. Completely exhausted, they at length reached their wintering-station on the Chotanga, where, for the first time in three months, they again enjoyed the comfort of reposing themselves in a warm hut, and of tasting warm food. Here Laptew determined to remain till spring, and as soon as the weather allowed, to set off with the rest of his men for the mouth of the Ienissëi, where he hoped to obtain a supply of provisions and ammunition from the magazine which had been left there.

The indefatigable Laptew, meanwhile, did not remain idle. During the winter he exerted him-

self to collect as many stores, dogs, and sledges, as possible, and in April, 1741, he sent off the mate, Tcheliuiskin, with some sledges, to examine and survey the coast between the Chotanga and the Taimura. For this purpose he was ordered to proceed to the Pässina River, to buy provisions for men and dogs from the Tonguses dwelling there, and then to follow the coast towards the N.E. to the Taimura. Laptew himself intended to proceed round the Taimura cape from the eastern side, which had not been examined during the preceding year, and thus to meet Tcheliuiskin. The Geodet Tchekin was sent with three sledges to survey the coast to the west of the Taimura. The remainder of the crew set out, on the 10th of April, in reindeer sledges, for the mouth of the Ienissei.

On the 24th, Laptew departed, and proceeded in a north-westerly direction across the tundra, in search of the Taimura Lake, distant 192 wersts, where he arrived on the 30th, after having crossed several lakes and small rivers. The Taimura River, which flows from the lake of the same name, is from two to two and a-half wersts broad. The northern shore of both river and lake consists of hills or rocks of a yellow colour. In one of these he found a cavern, five fathom deep and three fathom broad, the walls of which were formed of black slate, and the floor of a white stone, resembling gypsum. On the 6th of May he arrived at the mouth of the river, which, according to his observation, lies in latitude 75° 36′; the variation was here two points easterly.

Laptew set off again on the 10th of May, to cross the tundra and gain the sea-coast, which, however, he was prevented from surveying, by a

violent inflammation of the eyes. On the 17th he returned to his station on the Taimura, and, having rested, proceeded again along the coast, to meet Tcheliuiskin, who had been commissioned to survey the coast eastward from the Pässina. On the 20th, at noon, he observed the latitude 75° 33′, and on the following day found himself at a rocky head-land in latitude 75° 49′, the variation being the same as before. He continued the survey of the coast, which trended generally N.E., driving over the ice, which had every appearance of being thawed in the summer. The coast every where consisted of masses of rock, seldom interrupted by flat or low ground. On the sea, fresh hummocks were seen, which induced Laptew to believe that there was open water in summer. On the 24th, he observed the latitude 76° 38′. From this point he went three wersts further towards the S.W., and, having satisfied himself that the coast ran decidedly in a southerly direction, he erected a lofty signal on a prominent point of land. Seventeen wersts further, he found a similar erection raised by Tchekin in the year 1740.

On the 27th, in latitude 76° 23′, he found a great quantity of drift-wood, which had been extremely scarce on the eastern coast. On the 29th he was in latitude 75° 37′, and on the 1st of June, in 75° 21′. The coast continued bold in character, but less steep.

On the 2nd of July he met Tcheliuiskin, after which they continued to survey together to the mouth of the Pässina, where they found a Tonguse settlement in 73° 39′.* The variation was

* Minin's map assigns the latitude of 73° 38′ to the mouth of the Pässina.

here 21° east. On the way they found a landmark erected by Minin, within which was an empty space, where they deposited some provisions for Tchekin, and food for his dogs.

They arrived on the 11th at a second Tonguse settlement, whence Laptew despatched Tcheliuiskin with a couple of narti, to the Ienisëi; he himself determined to remain, to recruit his dogs by a few days' rest before he continued his journey.

Tcheliuiskin arrived at the mouth of the Ienissëi on the 29th of July, ascended the river, and, on the 4th of August met Lieutenant Laptew, who had come in a straight line across the tundra. On the 11th, they fell in with the remainder of the crew at the confluence of the Dudina with the Ienissëi, in latitude 69° 40′. Shortly afterwards, and to Laptew's great vexation, Tchekin joined them. Prevented by a multitude of apparently insurmountable obstacles from executing the task assigned him, he had returned to the Chotanga, and thence, in a direct line, to the Ienissëi. On the 29th of August the whole party arrived at the little town of Mangaseisk, where it was resolved to spend the winter.

To complete the survey of that part of the coast westward from Cape St. Faddei, which had not yet been examined, Laptew sent Tcheliuiskin away on the 4th of December, with narti, and followed him four days later. On the 16th of July, 1742, he returned to Mangaseisk, without having made any important addition to his previous survey. Tcheliuiskin's expedition proved equally fruitless. He arrived, indeed, on the 1st of May, at Cape St. Faddei, satisfied himself that

that was not the northern extremity of Asia, and went along the whole of the coast not previously surveyed; but as he took no observation, and did not determine the latitude of a single point, the whole result of his last journey consists in his having ascertained that this part of the coast is bounded along its whole extent by the ocean, and is nowhere connected with any unknown Polar continent. Tcheliuiskin arrived at Mangaseisk on the 20th of July, 1742. The whole remnant of his crew having now assembled at Mangaseisk, Laptew set off with them for Ienisseisk, where they arrived on the 29th of August. Shortly afterwards he went to St. Petersburg, to report the result of his expedition to the Admiralty.

In the year 1735 (August 9), Lieutenant Lassinius on parting company with Prontchichtchew, at the mouth of the Lena, sailed eastward. On the 13th he encountered large masses of ice, among which he spent five days in great danger, and, finding it impossible to proceed further, was compelled to run into the River Chariulach, 120 wersts from the easternmost mouth of the Lena, and to winter there. They found such a quantity of drift-wood, that they were able to build themselves a house with several partitions, in which there was room to lodge the whole crew; but although in this respect they were well provided, the scurvy broke out with such violence, that, of fifty-two men composing the crew, only a priest, the second mate, and seven seamen remained alive. Lassinius himself, after protracted sufferings, fell a victim to the disease.

Commodore Behring, on receiving news of these disasters, sent the mate, Schtcherbinin, with fourteen seamen, from Iakutsk. These arrived

on the 4th of June, 1736, at the winter settlement on the Chariulach, where they found the few survivors in so deplorable a condition, that it was necessary to send them to Iakutsk, and several died on their way.

The further command of the expedition was now intrusted to Lieutenant Demetrius Laptew, who went down to the Lena, with the necessary number of men, in flat-bottomed vessels, which were likewise laden with a supply of provisions and other necessaries. He found the sea so full of ice that he could not venture out with his barges, but left them at the mouth of the river, embarked a part of his men in small boats, and endeavoured, by creeping along the coast, to reach the Chariulach, where his vessel was lying. He arrived there on the 18th of July, refitted the vessel, put to sea on the 30th, and, having taken on board the stores left at the mouth of the Lena, continued his voyage on the 11th of August, sailing eastward along the coast. The sea was almost wholly covered with floating ice, by which, on the 14th, the vessel was beset, and drifted in the ice for several days. When she got into open water again, the season was so far advanced, that they returned to the Lena. On the 22nd of August they reached the Bykow mouth of the river. On the 27th, by an observation of the Pole Star, the variation was found 3° E. On the 6th of September they drew their vessel into the Chomutowka River, where they intended to winter, and on the 8th the whole Lena was covered with ice. During the winter, symptoms of scurvy manifested themselves repeatedly among the crew; but, by frequent exercise in the open air, and by the use of a

decoction of the bark and the tender shoots of the Siberian Cedar, the disease was checked.

In the report which Demetrius Laptew forwarded to Commodore Behring at Iakutsk, he gave his opinion, that "it was impossible to double the capes, Borgo* and Svätoi, since, according to the unanimous testimony of several Iakuts residing there, the surrounding masses of ice never melt or detach themselves from the coast. As, therefore, every further attempt must prove fruitless, he requested permission to return with his vessel to Iakutsk." This permission he obtained, and on the 29th of May, 1737, began to ascend the Lena. He examined the channel very minutely, in which he found from three to four fathoms water, and surveyed the banks with the same care. He arrived at Iakutsk on the 2nd of July, and was sent by Commodore Behring to St. Petersburg to make his personal report, and to explain the grounds why he deemed it impossible to sail from the Lena to the Kolyma. He delivered to the Admiralty his charts and journals, and furnished some additional explanations. These the College laid before the Senate, and the latter, after a careful investigation decided, that another attempt should be made to navigate the Polar Ocean eastward from the Lena, and should the task really prove impracticable, that the coast should be surveyed by a land-expedition.

In obedience to these instructions Laptew returned to Iakutsk, where he immediately commenced preparations for another voyage, and on the 7th of June, 1739, began to descend the

* Bor Chaja in the map.

Lena. On the 21st, at the Bykow mouth, he found the seaman Loschkin, who had been sent from Iakutsk in the spring, with rein-deer, to examine the coast from the Lena to the Svätoi Noss.

Laptew was obliged, on account of the ice, to remain till the 23rd of July under shelter of the Bykow headland, which, by the ship's reckoning, was in lat. 71° 42′. During this interval, the mate Schtcherbinin surveyed the coast as far as Cape Borgo, and discovered a shoal extending two geographical miles N. and N.N.E. from the Cape, not marked on any previous chart, though easily detected from the ice remaining fixed upon it.

On the 24th Laptew put to sea, but it was only with great exertions that he was able to work his way through the ice. He completed the survey of Borgo Bay, and on the 8th of August arrived off the Cape of the same name, which he found to be in lat. 71° 55′. The soundings gave twelve fathoms. On the same day he passed round the above-mentioned shoal, and on the 11th of August, arrived off the mouth of the Iana, where he anchored. On the 13th he sailed again with a favourable wind, and soundings varying from two to ten fathoms. On the 15th he doubled Svätoi Noss, the latitude by reckoning being 72° 50′. On the eastern side he found eighteen, seventeen, and thirteen fathoms, but at a quarter of a mile from the shore, only two fathoms. After a run of twenty-seven geographical miles east from this cape, they saw the island of Mercuriew, bearing N.E.; and sixteen geographical miles further the island of Diomid,

bearing N.N.W. ¼ W., distant three and a half German miles.*

A remarkably dense fog obliged them to lie-to on the 16th. On the 18th they had made about 105 miles east from the Svätoi Noss, when they saw what appeared to them an island, bearing E.N.E., but which they did not venture to approach, on account of the dense fog. The following morning, they were satisfied that the supposed island was only one of the lofty masses of ice that were drifting about in all directions. On the 19th there fell a great deal of snow, accompanied by a south-east wind. On the 21st they met with a strong current, which made it extremely difficult to work to windward, and the next day they found themselves in fresh water. Presuming from this circumstance that they were near the mouth of some large river, the long boat was sent out for information. During her absence, a violent storm from the south-east arose on the 24th. A strong current from the same quarter made it extremely difficult for the ship to keep her anchorage. On the 26th the storm subsided, and the water immediately became salt again. The boat not returning, the vessel drew nearer the coast, and fired signal-guns from time to time, but in vain. In the mean time large masses of ice bore down from the south-east, obliging her continually to alter her course, and causing some damage to her sides. On the 31st they were again in fresh water, and Laptew sent out the mate with the second boat, to look for the first, and for some

* On Laptew's chart, the latter only of these islands is marked. We shall see in the sequel, that neither of them exists at present.

suitable wintering place. It was only with great difficulty that the boat was able to make the shore.

On the 1st of September, the surface of the sea was completely covered with ice. Neither boat returned, though signal-guns were constantly fired; and on the 4th a strong wind arose from the W.S.W. The water rose considerably, the ice broke up, and the ship was driven towards the N.E. at the rate of two and a-half wersts an hour. The soundings increased from ten feet to five fathoms. On the 7th the wind subsided, and on the 9th the ship was completely frozen in, in twelve feet water. A large rampart of ice formed itself about two and a half wersts further south.

On the 20th of September, the mate, who, on the 31st of August, had been sent out with the second boat, returned on foot over the ice, and reported that the river, opposite to which they were, was the Indigirka, that the nearest entrance was about fifty wersts from the vessel; and that, according to some Iakuts who had come from thence, a Russian winter-station was established there. This good news diffused general joy. Some of the men set out immediately for the station, to make the necessary preparations; and on the 24th the whole crew followed. The necessary provisions, &c. were conveyed in narti by the Iakuts.

Laptew made several local surveys during the winter. He sent the Geodet Kindäkow with narti, to examine the coast as far as the Kolyma, and went himself, in a similar manner, in the opposite direction, as far as the Chroma, which he found too shallow for any but small boats to

enter. In general he observed, that to the east of Svätoi Noss, the shoals extend so far out that the low shore is but seldom visible from the sea. Another remarkable circumstance which he mentions is, that in the Indigirka, thirty wersts above the mouth, large quantities of drift-wood are found, whereas, along the sea-shore none is to be seen. On the 15th of June, by an altitude of the sun, the mouth of the Indigirka was found to be in latitude 70° 58′. The variation was 7° E.

In the spring of 1740, Laptew resolved to bring his vessel to a place of security, there to receive the requisite repairs to enable her to proceed on her voyage. For this purpose it became necessary to cut a long channel through the ice, a labour of such magnitude, that, notwithstanding the constant exertions of the whole crew, it was not till the end of June that the vessel could be drawn to the coast. On the 31st of July the repairs were concluded. On the 2nd of August she passed the mouth of the Alasei, situated, according to the ship's reckoning, in 70° 58′ N.

On the 3rd of August, an island was discovered, (now known as the first of the Bear Islands,) to which Laptew gave the name of St. Anthony. The centre of the island, according to the ship's reckoning, was calculated to be in 71° N. The sea being tolerably free from ice, Laptew made no stay at the island, but continued on an easterly course, and on the 4th arrived off the mouth of the Middle Kolyma, where he sent out his boat to examine the channel, and to inform the inhabitants of a neighbouring settlement of the progress of his voyage. On the 8th he encountered a large quantity of ice, through which he advanced with difficulty, and reached the lesser Baranov Rock on the 9th. On the 10th,

11th, and 12th, a strong wind blew from the west, with a current running E.S.E. at the rate of two knots an hour. These brought large quantities of ice down upon the ship, which was placed in greater danger, as the unbroken line of coast presented no inlet in which a shelter might have been obtained. On the 14th, when they were off the greater Baranov Rock, an unbroken line of ice, connected with the shore, and stretching out as far as the eye could reach, prevented all further progress, and obliged them to return to the Kolyma, which they entered on the 15th, having at first only from nine to fourteen feet water, which, however, on passing the island of Merchojannow, deepened to two and seven fathoms. On the 24th they arrived off Nijnei Kolymsk, which at that time consisted only of an Ostrog or fort, and about ten huts. There Laptew determined to winter. He took two observations, one on the 28th, and the other on the 31st of August; the former made the latitude of the Ostrog 68° 31′, the other 68° 34′.* The variation was 8° 30′ E.

During the winter, Laptew built two large boats, which he hoped to find useful in his summer voyage. On the 8th of July, 1741, the

* The accuracy of Laptew's observations deserves particular mention; to judge of his merit in this respect, it is only necessary to compare the latitude assigned by him to the principal points, with the observations recently made with the best modern astronomical instruments.

	According to Laptew.	According to observations in 1823.
	° ′	° ′
Cape Borgo	71 55	71 56
Svätoi Noss	72 50	72 54
Nijnei Kolymsk	68 33½	68 32

Kolyma was free from ice, and he put to sea. He took an easterly course, and sent his two newly built boats on before, to take soundings, and to show by signals where channels presented themselves between the ice, in order that the ship might be subjected to as little delay as possible. Till the 5th of August, the voyage proceeded slowly owing to contrary winds, but unattended by any great difficulty; their further progress was, however, at length effectually arrested by large fields of fixed ice, which forced them on the 7th of August to return to Nijnei Kolymsk, where they arrived on the 10th.

Thus ended the fourth voyage of Lieutenant Demetrius Laptew. On this occasion, as in the preceding year, he was unable to double the greater Baranov Rock, which, accordingly, is the extreme eastern point to which this zealous and intelligent seaman extended his survey of the coast of the Polar Ocean; a survey which embraced an extent of 37° of longitude from the mouth of the Lena.

Considering it impossible to effect by sea the task assigned him of surveying the Anadyr River, Laptew resolved on an undertaking attended by equal danger and difficulty, namely, to proceed overland with his whole crew, crossing the mountains, and traversing the country of the hostile Tchuktches. With this view, he left Nijnei Kolymsk on the 27th of October, 1741, and directed his course towards the Anadyr, with forty-five narti, drawn by dogs. On the 4th of November, he arrived at Lobasnoie, on the Greater Aniui. As that river forms the boundary of the country inhabited by the wandering Tchuktches, Laptew deemed it prudent,

during his passage through what might in some measure be considered an enemy's territory, to observe the utmost caution, and to subject his men to a strict military discipline. They ascended the Greater Aniui, crossed the chain of mountains Iablonnoi Chrebét, and reached the Anadyr Ostrog* on the 17th of November, without having seen a single Tchuktche on the way.

In Laptew's Journal, under February, 1742, we find the following remark: "From the 26th to the 28th, at night, we saw an unusual star or comet, that made its appearance about midnight. It had a long pointed tail, that stretched away to the south, and sometimes divided into two points. This tail was as luminous as the star itself. Towards morning it altered its direction, and turned towards the west; it then became gradually darker, till at last it disappeared altogether, and nothing but the star remained."

On the 9th of June, Laptew went down the Anadyr with two boats, built during the winter; as, however, the river had inundated the country to a great extent, he could not examine its banks, but was forced to content himself with surveying the mouth, which he reached on the 11th of July. With the beginning of autumn, he returned to the Ostrog, and thence, by Nijnei Kolymsk, to Iakutsk, where he arrived on the 8th of March, 1743, after an absence of seven years. Thence he proceeded to St. Petersburg, to make a personal report of the result of his expedition.

This brief account of the expeditions under-

* On the 13th March, 1742, Laptew took an observation, which gave him for the latitude of this place 64° 54′. The variation was 20° east.

taken by the Russians, from 1600 to 1743, in these inhospitable regions, affords but a faint idea of the innumerable dangers, hardships, and difficulties, with which our sailors had constantly to struggle; and to which they as constantly opposed patience, presence of mind, firmness, and an indefatigable zeal in the discharge of their duties. These qualities, which may be said to be characteristic of the seamen of all times and all nations, display themselves in so striking a degree, more particularly in Prontchichtchew, Lassinius, and perhaps most of all in Demetrius Laptew, that we cannot withhold from them the tribute of our admiration; though in a scientific point of view, the result of their labour was not always satisfactory; the inaccuracy of many of their observations must be attributed to the want of those excellent instruments, which are the production of more modern times.

With respect to their hydrographical labours, it may be remarked, that the survey of the coast of Siberia, eastward from the White Sea, was made in vessels that could not always approach sufficiently near the shore to make exact observations, and that it was, consequently, often superficial, and occasionally inaccurate. Nevertheless, among their observations, we find many good determinations of latitude, and good soundings, as well along the coast, as in the principal rivers of Siberia. Moreover, the charts and journals of Owzyn, Minin, Tcheliuiskin, Prontchichtchew, and the two Laptews, furnish many interesting hydrographical contributions to our knowledge of the coast and islands, from the Gulf of Obi, to the Baranov Rocks. Unfortunately, the greater part of their survey is based on the ships'

reckoning, which, owing to the influence of currents, and the constant change of course rendered necessary by the ice, cannot be much relied on. Nor could their astronomical observations, to determine the latitude, be always taken with due accuracy. From the mouth of the Taimura to Cape St. Faddei, the navigation was never effected; and the survey of the Mate Tcheliuiskin, by means of sledges along the ice, is so superficial and vague, that the real situation of the northern extremity of Asia still remains undetermined. No attempt was in any instance made to determine the longitude by observation. All these labours therefore, properly speaking, can be looked on in no other light, than as preparatory to a more exact survey of these regions.

The unsatisfactory result of the various expeditions to the Polar Ocean, and the endless dangers and hardships with which they were attended, appear to have deterred from similar undertakings for some time. For twenty years we find no mention of any renewed attempt. At length, in 1760, Schalarov, a merchant of Iakutsk, built a vessel on the Lena at his own expense, with which he proposed to sail round the eastern extreme of Asia, into the Pacific, or to Kamtschatka.

According to Von Berg, (*Chronologische Geschichte der Seefahrten, Th.* i. *S.* 144,) Schalarov undertook the expedition with the view of seeking for mammoth-bones in the island previously discovered by the Iakut Eterikan, and was particularly excited thereto by the exclusive privilege granted to the merchant Liakhow.*

* There appears some inaccuracy here. The exclusive privilege to Liakhow, is stated further on in page 470, to have been granted in or subsequent to the year 1770.—[ENGLISH EDITOR.]

The *Sibirskoi Vestnik*, of 1822, expresses the same opinion, adding, that Schalarov had it in view to seek the land supposed to lie opposite the mouth of the Kolyma. Neither of these assertions appears to me to be well founded. The sequel shews that Schalarov's object was not to seek for mammoth-bones, nor had he any intention of sailing so far north. His main purpose was to accomplish the yet unknown navigation round Cape Chelagskoi, and to proceed further towards the east. Deshnew sought to enrich himself; Schalarov desired only the glory of achieving a task which was deemed impossible. He staked his life and his whole fortune on the success of his undertaking; let us not withhold from him the well-merited honour of having been actuated by disinterestedness and public spirit.

The expedition and the fate of Schalarov are so interesting, and probably so little known, that a brief notice of them will scarcely be deemed superfluous. In the absence of more circumstantial and authoritative sources, I have borrowed the following facts chiefly from the account of Captain Billings's voyage, published by Coxe and Sauer.*

In July, 1761, Schalarov sailed from the Iana. To avoid the ice he kept as close to the coast as he could. He doubled the Svätoi Noss on the 6th of September, and discovered a mountainous island lying at a short distance to the north of the cape. He continued an easterly course, but being much impeded by drift-ice and contrary winds, it was only on the 16th that he was able

* In the hydrographical depot of the Marine Staff there exists an original chart by Schalarov with many explanatory notes; these I have availed myself of, to correct and complete this narrative.

to reach the strait formed by Diomid Island and the Siberian coast. The sea being tolerably free from ice, and the wind favourable, he passed the mouth of the Indigirka on the following day, and that of the Alasei on the 18th. Soon afterwards, however, between the Bear Islands and the continent, his progress was impeded by the ice. The season being far advanced, he determined to run into the Kolyma for the winter, where the crew built themselves a spacious dwelling, round which they erected a high rampart of snow, and planted on it the ship's guns. The neighbourhood abounded with wild rein-deer, which came fearlessly up to the rampart, so that they were able to kill a great many; they also caught a large quantity of fish before the river was quite frozen over, so that they were well provided with fresh provisions, to which they were probably indebted for their preservation from the scurvy. Only one of Schalarov's companions died towards the end of winter.

The ice in the Kolyma did not break up in 1762 until the 21st of July, when Schalarov put to sea again, and steered for a whole week on a N.E. and N.E. ¼ E. course. On the 28th, being on shore, he observed the variation 11° 15′ E.

On the 18th of August, after experiencing an alternation of contrary winds and calms, he found himself near the coast, which formed a high headland of coarse grey sand, and to which, on that account, he gave the name of Sand Cape. On the 19th the ship was completely beset by large fields of ice. In this dangerous situation, rendered more alarming by a dense fog that concealed the shore, they continued till the 23rd, when they found means to work themselves out of the ice,

and to gain open water again. They tacked for some time among the fields of ice, in the hope of making and doubling Cape Chelagskoi; but being detained by ice and contrary winds, the advanced season at length obliged Schalarov to seek for a convenient wintering-place. This he hoped to find in an inlet on the west side of the cape which led into Tchaun Bay, first visited and surveyed by him. On the 25th he passed between the mainland and the Island of Arautan. On the 26th, he struck upon a sand-bank, from which it cost the crew much labour to get the ship afloat again. Schalarov went on shore, but finding neither trees nor drift-wood, was obliged to sail further, in search of some place provided with this indispensable requisite. He shaped his course along the southern shore of the bay, as far as the island of Sabadei. Finally, he resolved to return to the Kolyma, which he entered on the 12th of September, and re-occupied his quarters of the preceding winter.

On the return of spring, Schalarov desired to put to sea again, in the hope of effecting his favourite object, the doubling of Cape Chelagskoi; but his crew, weary of the hardships and privations they had endured, mutinied, and left him. This forced him to return to the Lena. He then went to Moscow, and, having obtained some pecuniary assistance from the government, undertook, in 1764, another voyage to Cape Chelagskoi, from which he never returned.

For a long time none but vague rumours circulated respecting his fate. I was so fortunate in 1823, as to discover the spot, about seventy miles from Cape Chelagskoi, where Schalarov and his companions landed, after they had seen their

vessel destroyed by the ice. Here, in a bleak wilderness, struggling against want and misery, he ended his active life; but a late posterity renders this well-deserved tribute of acknowledgment to the rare disinterested spirit of enterprise by which he was animated.

On Schalarov's chart, the coast from the Iana to the Cape Chelagskoi is laid down with an accuracy that does honour to its author. He was the first navigator that examined Tchaun Bay, and since his time no fresh soundings have been taken there. His latitudes are usually one and a-half degree higher than the truth, and were probably not the result of observation. Between the Kolyma and the Lena the latitudes are more correct, but appear to have been copied from Demetrius Laptew. The Arautan Islands, in Tchaun Bay, are accurately marked in Schalarov's chart, and only two are laid down. On Coxe's map there are three, an error which has been since copied into many other maps.

The current in the Polar Ocean, during summer, from east to west, observed by Schalarov, has been confirmed by several navigators. In his observations of variation, he approaches those made by us. For example, at the Baranov Rocks, the variation was,

According to Schalarov, in 1762 . . 11° 15′ E.
According to Billings, in 1787 . . . 17° 12′
According to our observations . . . 12° 35′

From the preceding account of Schalarov's course, it would appear, that he saw Diomid Island in 1761, just as Demetrius Laptew saw it in 1739, namely, 47 geographical miles N. E. from Svätoi Noss, and 18 miles from the nearest part of the coast. Neither Hedenström, however, in 1810,

nor Lieutenant Anjou, in 1823, could discover any trace of it, and the oldest fur-hunters, men frequently in the habit of exploring this part of the country, cannot remember ever to have heard of any island in the situation described. It may, therefore, safely be assumed that, now at least, no such island exists. It has been supposed (by the author of the *Chronologische Geschichte der Reisen*) that a connexion may since have taken place between this island and the continent, but it is also possible, that both the earlier navigators may have been deceived by some enormous mass of ice, which has since disappeared, or that Diomid Island may have existed in their time, and may no longer exist. Upon the latter hypothesis, it would be possible to account for the change that appears to have taken place since their time in the general aspect of the coast, to the east of Svätoi Noss, for on their charts it is described as extremely sinuous and indented, whereas in the recent and more exact surveys, it was found to preserve a tolerably straight line. With respect to the mountainous land seen by Schalarov to the north of Svätoi Noss, it is unquestionably no other than the first of the Liakhow Islands, upon which there are several mountains.

The islands, opposite the mouths of the Iana and Kolyma Rivers so constantly and frequently visited, could not long remain unknown. The rich store of mammoth-bones discovered, in 1750, by the merchant Liakhow, on the tundra between the Rivers Chotanga and Anadyr,* excited many private individuals to institute similar researches in the Polar regions. Among the inhabitants of

* Berg's Chronologische Geschichte der Reisen, Bd. 11. S. 144.

the coast, there existed an old tradition of an island opposite Svätoi Noss. Schalarov had seen mountains in that direction; nothing more was necessary to excite those desirous of gain, to embark in undertakings in that direction.

The Iakut Eterikan, of Ustiansk, determined, in 1759 or 1760,* on an expedition, in which he saw an island opposite Cape Svätoi Noss; this is the first of the group of islands, to which, by order of the Empress Catherine II., the name of the Liakhow Islands was given, in honour of the merchant of that name, who first visited them.

Of the Bear Isles, at that time, there existed very incomplete accounts, founded merely on oral statements; the assertion often repeated, that America reached as far as the north of the Kolyma, was likewise deserving of a more close investigation. This was intrusted, in 1762, to the Serjeant Andrejew, whom Tchitcheren, then Governor of Siberia, sent to the Kolyma for that purpose.†

Andrejew started from Nijnei Kolymsk, in narti, on the 4th of March, 1763. He first proceeded to the river Krestowoi, and thence to the Indigirka, where he was to be joined by Schkulew, a Cossack acquainted with the country. They returned together to the Krestowoi, whence they started over the ice, on the 4th of April. After a drive of about ninety wersts, they came to the first island, the length of which, from east to west, parallel with the continent, they estimated at fifty wersts, the breadth at forty, and the circumference at

* Hedenström's Journey, in the *Sibirskoi Vestnik.*

† Pallas. *Neue Nordische Beitrage*, Bd. vii. S. 134—142.

one hundred. They visited the remaining islands belonging to the group, and found every where traces of former inhabitants; *i. e.* ruined yourtes constructed of earth. Among the latter, one was particularly remarkable. It was found at the foot of a rock, on the third island, which Andrejew calculated to extend sixty wersts in length. The following is his description of this ruin of a former settlement:—

"From the northern side of this island a sand-bank runs into the sea to a distance of eleven fathoms from the shore. The greater part is covered at high water, but it happened to be dry when we saw it. On this sand-bank is a soft sandstone rock, forming, at the height of three fathoms, a terrace, on which a kind of fortress has been erected. To increase the breadth of the terrace, the trunks of ten strong larch-trees have been placed with their roots upwards, forming a support to a fabric of beams of the usual form of our *lobassy* (a kind of warehouse,) the whole reminding one very much of a bird's nest. The floor in the interior is formed of the trunks of larch trees, covered by a layer of earth seven inches deep. In the inside, at a little distance from the outer wall, a second wall, about three feet six inches in height, has been formed of split trunks or rough boards, and the intervening space filled with earth. The walls without are likewise protected with earth and sods of moss. The roof consists of pine and larch branches irregularly thrown upon each other, and formerly, probably, covered likewise with earth; but at present, the greater part of the covering has fallen in. To hold the building together, cross beams have been let into the cornice, and fastened with

thongs of leather. The beams appear to have been hewn, not with an iron axe, but with one of stone or wood, and look almost as if they had been gnawed by teeth. The building is at present four and a half fathoms in length, and four fathoms in breadth, but appears originally to have been six fathoms square. From this yourte a path leads to the shore, and another to the summit of the rock; both, however, are now very ruinous. This fortress has been built with great care, and, owing to the height and the narrow space on which it stands, must have required great labour. According to all appearances, I should say it had not been built by Russians, but by what other nation cannot now be determined."

After Andrejew had driven round the first four islands of this group, he visited the fifth likewise, which, according to his calculation, is 140 wersts in circumference, and fifty in diameter. This island is situated 100 wersts from the fourth, towards Tchaun Bay, "or rather towards Cape Tchukotskoi." On this island, likewise, were found some ruinous yourtes, and on the western side were observed two rocks, bearing a strong resemblance to the human form. "Here," says Andrejew, "we ascended a mountain, and looked around us on every side; towards the south we saw a detached rock, which, we concluded, must be the Chovinsk Rock; to the east, all was of an indistinct blue or dark colour, but whether land or open water, I cannot take upon myself to decide."

Andrejew returned to the Krestowoi; he concludes his journal with these words:—"The Cossack Fedor Tatarinow and his companions have indeed estimated the distance from the Krestowoi

to the first island, and thence to the fifth, as well as the size of each; their estimates, however, are evidently erroneous, and much exaggerated; mine, on the other hand, are correct, and cannot contain more than a trifling inaccuracy of a few wersts."

Notwithstanding this modest assurance, Andrejew's estimate is wrong by 440 wersts, when he describes these islands as lying 550 wersts eastward from the Krestowoi. Their situation and distance from each other he lays down with the same inaccuracy. All trace of the fortified yourte, and the rock on which it was built, must since then have been destroyed, for the expedition sent there in 1820 found nothing of the sort. Ruinous dwellings were found by us on several other of the islands, but they are nothing more than huts constructed by travellers, and no more prove that these islands had ever permanent inhabitants, than do the equally ruinous yourtes that we frequently met with on the totally uninhabited coast of Cape Chelagskoi.*

With respect to the blueish, or dark appearance in the distance, which Andrejew asserts to have seen from the fifth island, I must remark, that we examined the whole of this part of the

* Von Berg, in his *Chronologische Geschichte der Reisen*, Bd. i. S. 148, says, "These buildings, deserted by their former inhabitants, may afford us some idea of the changes our globe has undergone in its revolutions during a period of many centuries."—A hasty glance at these half-subterranean WOODEN yourtes is quite enough to convince any one, that they are not the remains of any remote antiquity, but merely huts resembling those still in use among the population of these regions, and of too slight a construction, and too perishable a material, to permit of their having remained for centuries as the monuments of a departed race.

ocean, in 1821, and 1822, most closely, to a distance of 250 wersts, without finding any land; so that what Andrejew fancied might be land, must evidently have been one of those optical illusions which occur so frequently in the polar latitudes.

He appears to have paid a second visit to these islands in the following year; for in the instructions given to Captain Billings,* it is stated, among other matters, that "in the year 1764, Serjeant Andrejew saw an extensive country at a great distance from the last of the Bear Isles. He took it to be an island of considerable extent, and drove with his narti in that direction. About twenty wersts before reaching it, he discovered traces of a numerous tribe that appeared to have gone thither with rein-deer, and as he had but few companions, he did not venture to proceed, but returned to the Kolyma."

How little Andrejew's assertions are to be depended on, we have already seen. If, however, he really saw land and the traces of rein-deer in the direction here stated, he must, without being aware of it, have approached the main land of Asia. Unless we suppose this, we must consider the whole story as a mere fable, embellished afterwards with a variety of unfounded or mistaken additions. Thus we find, in the *Sibirskoi Vestnik*, of 1823, a note annexed to the narrative of Andrejew's expedition, which says: "Other accounts prove that this country is inhabited, and is called *Tikegen* by the natives, who call themselves Krachai, and consist of two principal tribes. Some of them wear beards, and bear a resem-

* Billing's Voyage, published by Vice-Admiral Sarytschew p. 190.

blance to the Russians; others appear to belong to the race of the Tchuktches. The Sotnik of Cossacks Kobelew and the interpreter Daurkin, who accompanied Captain Billings, not only confirm Andrejew's account, but even give us a map, drawn by an American chief, of the country seen by Andrejew."

The land here spoken of is, no doubt, the north-western coast of America, the principal bays and headlands of which were probably known to the American chief; but as to the tribe here designated as the Krachai, the report of their existence reposes, as will be seen in the narrative, on some misunderstood verbal relations of the Tchuktches who live about Cape North.

Andrejew's account of a large land situated towards the north, was the occasion of a secret expedition from Tobolsk, which would probably have remained altogether unknown, had not Von Berg found the journal among the archives of Tobolsk. The following is a brief abstract:—

In June, 1767, the Geodets Leontiew, Lyssow, and Pushkarew, went from Iakutsk to Ochotsk, and thence to Nijnei Kolymsk, where they arrived on the 28th of February, 1768, and in the following year proceeded on their expedition over the ice of the Polar Ocean. They left Nijnei Kolymsk on narti on the 1st of March, 1769, and on the 17th reached the mouth of the Krestowoi. Thence they went to the Bear Islands, which they surveyed with much accuracy, so that, when we visited them in 1821, we had only a few unimportant corrections to make. They also saw some remains of the yourtes spoken of by Andrejew.

On the 23rd of March they were in a small bay of the eastern island, to which Leontiew assigns the latitude 71° 58′. According to my

observation in 1821 the latitude is 70° 37′. They drove over the sea in a north-easterly direction, but after having proceeded thirty-seven wersts between hummocks and large spaces covered with sea-salt, they stopped for the night. A west wind setting suddenly in broke the ice, and forced them, without delay, to go in search of a place of more security. Strong winds and thick snow-storms detained them till the 26th, when, after having gone three wersts N.W., they found the ice so thin, that they dared not venture further; "for," says the journal, "the distance of the great American land is not known." Being in want, moreover, of food for themselves and their dogs, the latter being scarcely in a condition to drag the narti after them, they determined to return, and arrived at Nijnei Kolymsk on the 7th of April, having, by their own calculation, gone over 839 wersts, going and returning.

In the following year, (1770,) they left Nijnei Kolymsk again on the 28th of February, and on the 7th of March crossed to the most easterly of the Bear Islands, where the bad weather forced them to remain till the 16th. They then started in a N.E. course, "in the direction of the great American land." On the first day they went twenty-eight wersts, and on the following days, their progress through the constantly-increasing hummocks was as follows:—

				Wersts.
On the 17th . .	towards	N.	8 E.	25
18th . .		N.	5 E.	18
19th . .		N.	5 E.	25
20th . .		N.	5 E.	22
21st . .		N.	5 E.	18
22nd . .		N.	10 E.	18
23rd & 24th		N.	15 E.	41
				167

On the 25th the narti were found to have been so much worn among the hummocks, and particularly by the sea-salt, that they were forced to halt for two days to repair them. On the 27th, as the journey was becoming more and more difficult, it was resolved that Lyssow and Pushkarew with ten companions, should proceed, with three days' provisions, on narti drawn by chosen dogs, "to try whether any land could be found." After going five wersts further, they came to fresh hummocks seven fathoms high, among which they continued their course for thirty wersts. They ascended some of the highest, and as, with the aid of the telescope, they "could discover nothing but hummocks in every direction, they commenced their return on the 28th." During their return, they were five times obliged to cross newly-formed fissures in the ice of two feet and upwards in breadth. They returned to the fifth Bear Island on the 1st of April, and remained there three days to dry their wet clothes. During this time they killed four white bears.

On the 5th of April, the whole party started again, and arrived at Nijnei Kolymsk on the 9th. According to their calculation, they had, on this occasion, gone over 950 wersts. Taking the variation of the compass to be 15° E., the point whence they were forced to return must have been in 72° N. latitude.

The Geodets undertook a third excursion over the ice in 1771. Starting from the Kolyma, they arrived at the last of the Bear Islands on the 9th of March. There they remained six days, on account of bad weather, and then started for Tchaun Bay. Three days they continued in a due east direction, and having gone forty-eight

wersts, turned off to the Baranov rocks, from which they were fifty wersts distant, and where they arrived on the 18th. Having rested there and killed a white bear, they continued their journey along the coast in an easterly direction, but on the 28th, their provisions running short, they were forced to return. On the 6th of April they arrived again at Nijnei Kolymsk, after driving about 433 wersts.

The coast from the Kolyma to Tchaun Bay is very carelessly drawn on Leontiew's chart, so much so, that, probably, they not only did not make any real survey of it themselves, but did not even avail themselves of the more ancient chart of Schalarov, on which this part of the coast is marked with tolerable accuracy. Such carelessness is the more remarkable, as in their survey of the Bear Islands, and in calculating their days' journeys, they state their distances even to fathoms, so that on level ground at least they must have made use of the chain. Indeed, some of the old people at Nijnei Kolymsk still remember that a chain was used on this occasion. The third excursion terminated the expedition. They returned to Tobolsk, whence Leontiew was sent to St. Petersburgh with the charts and reports.

Although this expedition, which lasted five years, and included three excursions on the ice, did not attain its main object, still it was in many respects of great utility. The Bear Islands were geometrically surveyed. The ocean was examined both to the north and to the east of those islands, and it was sufficiently shown, that Andrejew's assertion respecting their great extent was false, and his account of a large northern

land, inhabited by tribes owning rein-deer, entirely fabulous.

The Liakhow Islands, which more or less have formed the basis of the several stories about a large country to the north, were discovered by Liakhow, who, in March, 1770, happening to be on business at the Svätoi Nos, saw a large herd of rein-deer arriving over the ice from the north. He had probably heard of the discovery of the Iakut Eterikan, mentioned in page 461, and this may have led him to resolve on ascertaining whence the animals came. He started early in April with narti, and followed the track of the rein-deer in a northerly direction. After making seventy wersts, he came to an island where he spent the night, and proceeded on the following day, when he discovered a second island, distant twenty-wersts from the first. The track of the rein-deer continuing, he would have gone further, but impassable hummocks obliged him to desist.

On his return he sent a report of his discovery, and obtained from the government an exclusive privilege to dig for mammoth-bones, and to hunt stone-foxes on the islands which had been discovered, and which should be discovered by him. At the same time an order was issued to name the islands after him.

In the summer of 1773, Liakhow, accompanied by another merchant, of the name of Protodiakonow, went from Svätoi Nos to the first island in a five-oared boat, and then on to the second. At no great distance to the north he saw land, to which he proceeded, and found it consisted of a third island, much larger in extent than either of the two former. The land was mountainous, and the whole coast covered with drift-wood.

Liakhow went back to the first island, built a good winter habitation, and in the following spring returned to Ustiansk with a rich cargo of furs and mammoth-bones.

Protodiakonow gave some particulars of the natural history of these islands to M. Sauer, when the latter was in Iakutsk with Captain Billings. The soil of the first island, he said, consisted only of sand and ice, but such quantities of mammoth-bones were found therein, that they seemed to form the chief substance of the island. Among the bones were likewise found the skull and horns of an animal resembling the buffalo. The third island was intersected by a multitude of rivulets, up which came a quantity of fish from the ocean. The travellers particularly noticed a small description of salmon, never seen in the Kolyma or Indigirka, and only met with in the neighbourhood of Ochozk, and about Kamtschatka. Whales and hausen *(Delphinus leucus?)* were seen in the sea, and white bears, wolves, and rein-deer on the land.

The accounts given by Liakhow and his companion of the great extent and the riches of the newly-discovered islands, induced the government, in 1775, to send Chwoinow, a land-surveyor, from Iakutsk, to make a regular survey of them. He arrived at the first island on the 16th of May. Its length he estimated at 150 wersts, the breadth varying from 80 to 20 wersts, and the circumference at 367 wersts. In the interior he found a lake of considerable extent, but very shallow, notwithstanding the precipitous character of its banks. On his map the dimensions are mostly inaccurate, but the survey itself, in many of its details, is very correct. Unfavour-

able weather, and an insufficient supply of food for the dogs, made it impossible to extend the survey to the other islands. He spent the winter at Liakhow's settlement, and in the spring returned to Ustiansk. In the two following years Chwoinow went on two separate occasions to complete the survey of the two other islands, but was not able to effect his object owing to an insufficient supply of stores, and he finally contented himself with drawing the second island on his map, *according to the accounts of the fur-hunters.*

In August, 1778, Captain Cook appeared in Behring Straits, with the intention of seeking a passage from the Pacific into the Atlantic, by sailing along the northern coast, either of Asia or America. Immense fields of ice at Icy Cape prevented his further progress eastward; and the lateness of the season obliged him to return from the promontory, called by him, Cape North, in 68° 56′ N. and 180° 49′ E. from Greenwich; variation 26° E. It appeared to Cook that the coast, beyond Cape North, ran nearly due west, and that a little way beyond the headland he could see a lake or a deep gulf. My survey of 1823, has shown this supposition to have been incorrect. His determination of the geographical position of the Cape agrees very nearly with my observations made on the spot itself, according to which I found it in 68° 55′ N. and 179° 57′ E. The variation I found to be 21° 40′ E.

Cook could only examine superficially the coast of Asia S.E. from Cape North. On his passage down it, he saw an island "four or five miles in circumference, of the middling height, with a steep rocky coast, about three leagues from the

main-land." On his chart, this island, called by him Burney's Island, is situated in 67° 45′ N. and 185° 5′ E.

There being no other island than Koliutchin in this neighbourhood, it is probably the same as the Burney's Island of Cook, being the point which I myself reached in 1823. The description of its outward appearance justifies this conclusion, although there is a difference in the geographical position; for, according to my observation, taken on the southern point of Koliutchin Island, it lies in 67° 26′ 46″ N. and, according to my reckoning, in 184° 28′ E.

Further towards the east, in 67° 3′ N. and 188° 11′ E. Cook saw a high perpendicular cape, projecting into the sea. "To the east of this, the coast is high and bold; to the west it is low, and trends N.N.W. and N.W. by W. which is nearly its direction all the way to Cape North. The depth of water is everywhere the same at the same distance from shore, which is also the case on the American side. We nowhere found more than twenty-three fathoms; the lead, therefore, is no bad guide by night, or in hazy weather."

Our survey of the coast from Cape Chelagskoi eastward to North Cape, and thence to Koliutchin Island, showed, that this part of the coast is neither high and steep, nor that it can properly be called flat. The character of the coast is extremely variable. Near Cape Onman, however, and near Cape Kyber and Cape Kosmin, are several hills of considerable elevation, and also a few precipitous rocks.

Cook, as well as the astronomer Bayley, during the navigation between Asia and America,

thought they saw several indications of the vicinity of land to the north. The almost imperceptible increase of depth on receding from either coast; the flocks of wild geese and ducks that arrived in the month of August from the north; the form of the ice, and various other circumstances, appeared to Burney, so many proofs that an undiscovered land must lie to the north of the strait. There were not, indeed, any currents, but the ice evidently floated towards the south.

The scientific researches of the English, in these imperfectly known regions, at length induced the Russian government to take some active steps on their part, to ascertain the extent and character of this part of their possessions. With this view, an expedition, well known to the learned world, was fitted out; commissioned, under the direction of Captain Billings, to institute hydrographical and geographical researches on the opposite coasts of Asia and America. The narrative of this expedition has been written in the Russian language, by one of Billings' most active companions, Captain Sarytschew, who attained the rank of Vice-Admiral before his death; and in 1805, a German translation was published by Busse; Sauer, the secretary to the expedition, published an account of it in English.*

Among other motives to this expedition, was a wish to make the passage from the Polar Ocean into the Pacific, through Behring Straits. Two vessels, particularly calculated for the intended service, were accordingly built on the Iassaschna River, not far from Nijnei Kolymsk, and received

* An account of a geographical and astronomical Expedition to the northern parts of Russia.

the names of the *Pallas* and the *Iassaschna*. The former was forty-five feet in length, the latter twenty-eight. The larger was commanded by Billings, the smaller by Sarytschew.

On the 25th of May, 1787, the two vessels sailed from the Iassaschna, down the Kolyma, and arrived on the 18th of June off Nijnei Kolymsk, which they found to be in 68° 17′ 14″ N. and 163° 17′ 30″ E. Variation 14° 14′ E. On the 22nd, they were off the eastern mouth of the Kolyma, not far from Schalarov's wintering station, and from Laptew's signal-tower. Captain Sarytschew observes: "The winter-dwellings erected by Laptew on the right bank where his vessel was drawn on shore, lead to the belief, that the channel must formerly have been on that side. At present, there is no water there for a vessel of any size, and even a boat can approach the shore only at high water. At low water, the shoal runs three wersts out to sea."

They weighed anchor on the 27th, and, after sailing six miles, found themselves in the Polar Ocean. "The channel, at the mouth of the stream, is 200 fathoms broad, with three to five fathoms in depth. The bottom is loose sand. The banks consist of steep rocks, eight fathoms high, at the foot of which there was a quantity of drift-wood."

The ice along the coast frequently obliged them to run into bays, and to take shelter behind head-lands. Thus, on the 28th of July, they were in a small bay, at the mouth of a rivulet, between the greater and lesser Baranov Rocks, where Captain Billings erected his observatory, and found the latitude 69° 27′ 30″; the longitude by chronometer was 167° 50′ 30″. On this oc-

casion he observes, "It may be seen that all charts of the Polar Ocean place the land two degrees too far to the north." The variation was 16° E.

Both vessels attempted, on the 1st of July, to sail towards the north, where there appeared to be less ice, but a fog, so dense that they could scarcely see two fathoms' length from the ship, caused them repeatedly to anchor. They were not able to go more than twenty miles to the north-east, before they were obliged to turn back "the whole sea, as far as the eye could reach, being covered with immense masses of ice, on which the waves broke with tremendous violence." On the 2nd, they anchored in a bay westward from that last mentioned. They made several attempts the following day, to proceed eastward, but the constant ice and frequent fogs impeded them so much, that they did not pass the great Baranov Rock before the 19th of July. Eleven miles further, they came to hummocks, many of which had grounded in sixteen fathoms water. It was not without difficulty and danger that they disengaged themselves from these masses, and came to anchor in a bay. Here Captain Billings held a council of officers, in which it was determined, on account of the manifest impossibility of going further, and in consideration of the lateness of the season, that they should return to the Kolyma. They accordingly towed their vessels westward, and reached the mouth of the Kolyma on the 26th of July, where they found the current so feeble, that they required only five days to take them to Nijnei Kolymsk. "Thus ended this navigation of the Frozen Ocean, as arduous as it was perilous."

At Nijnei Kolymsk, Billings again called his officers together, to consult in what way, whether by water or land, it would be most practicable to pass round capes Chelagskoi and Tchukotsky. "Experience had shown that by water this was nearly impossible; no other means therefore remained, but to undertake the expedition by land in sledges. On further consideration, however, this plan was also renounced, it being deemed impossible that they could take with them, for a distance of 200 wersts, the requisite quantity of food for the dogs." It was at length determined to make one more attempt by sea to double these capes; and to make the trial from the eastern side, through Behring Straits, with vessels to be fitted out for the purpose at Ochozk. In the mean time the Sotnik Kobelew and the interpreter Daurkin were ordered to proceed with the caravan of Tchuktches that annually arrived at Tassiginsk, to Tchukotsky Noss, there to await the arrival of the Russian vessels, and, if possible, to make some preparations for their reception.

Billings caused his two vessels to be unrigged, and left them under the charge of a public officer at Nijnei Kolymsk. He himself proceeded with the greater part of his crew, in two divisions, to Irkutsk, whence he repaired to Ochotsk, to make preparations for the intended voyage.

In 1771, Billings sailed from Avatsha Bay, in the *Slava Rossii*, for Behring Straits, and on his way ran into St. Laurence Bay, where the Tchuktches paid him a visit. They told him, the sea was at all times covered with such quantities of drift-ice, that its navigation was impracticable, not only to large vessels, but even to their baidars. It is singular that Billings paid

more attention to these statements than to his own previous experience,* and relinquished his plan of sailing round Cape Chelagskoi, merely on the assurance of these people. Instead of persevering in his first intention, he resolved on the much more difficult journey by land, through the country of the Tchuktches to Nijnei Kolymsk, a journey, the results of which could not but be comparatively unimportant. In vain his companions urged the danger to which he exposed himself and the expedition, by venturing among a savage and hostile people; he persisted in his determination; and on the 13th of August started with fourteen baidars, which brought him to Metchigme Bay, whence he commenced his journey by land, on rein-deer sledges, accompanied by a caravan of Tchuktches. At the same time, he sent the Geodet Gilew in a Tchuktche baidar, with orders to survey the coast from East Cape to Koliutchin Island, and then to rejoin him.

Gilew followed the coast in his boat, as far as the eastern promontory. There he landed, and went on foot over the narrow neck of land to the coast of the Polar Ocean, which he followed, partly on foot, and partly in his baidar, which was dragged after him. At length, when he was only ninety miles from Koliutchin Island, his companions, the Tchuktches, refused to go further. This embarrassed him not a little. Fortunately, however, he fell in with a tribe of nomade rein-deer Tchuktches, who undertook to convey him across the mountains in their sledges.

* Billings, it is well known, had been with Cook on his voyage, when he reached the North Cape without encountering much ice.

By these means he was able to join Captain Billings, whom he found near the upper part of the river Iugnei, which falls into Koliutchin Bay.

The mate Botakow, found here, about a werst from the Iugnei Lake, some hot springs, of which he observes, "these springs rise in a rocky height, and form four distinct oval basins, six to eight fathoms in circumference, the margins rising about one and a-half foot from the ground, and bending over on the outside. These margins are so thin, and at the same time so regularly formed, that one might take them for artificial boilers, placed there by the hand of man. The reservoirs are filled to the brim with warm water of a whitish colour, and so deep that we could find no bottom with a pole. In the middle several springs bubble up, making the water appear to be in the act of boiling. The sides of the reservoirs consist of a close, adhesive, chalky substance, of which the margins have no doubt been gradually formed. Two of these reservoirs are close together, the other two about fifty fathoms distant." Botakow imagines that the mountain from which these warm springs arise must formerly have been a volcano.

Billings went with the Geodet Gilew to the mouth of Koliutchin Bay, of which he says, "this bay is 120 miles N.W. from Behring Straits; it extends for sixty miles inland into the Tchuktche country; its breadth is not more than seven miles; it receives, besides smaller streams, the two rivers Iugnei and Kiliu; the former flowing from a lake of the same name, and the latter from mountains. The entrance of the bay is four miles across, with an island in the middle, three miles in circuit, named Peschone. The

Tchuktches told us that the western entrance is very shallow, but that on the eastern side of the island, the channel was so deep that sometimes whales entered the bay by it. Billing's chart places the middle of Koliutchin Island in 67° 30′ N. and 185° 26′ E.

On the 17th of February Billings arrived at the first Russian settlement on the Great Aniui, at its confluence with the Angarka. His journey was not only tedious and fatiguing, but in every other respect extremely disagreeable. The Tchuktches who accompanied him, and who travelled slowly with their rein-deer along the valleys fifty wersts from the coast, treated Billings and his companions as prisoners, and indulged in many insults towards them. Notwithstanding all these difficulties, however, Botakow was able to keep a correct account of the course, and to enter on his journal the distances between the several halting-places, and the position of the mountains; and from these, and various points of information which he obtained from the Tchuktches, he was able afterwards to prepare a map of the country.

Speaking of the Tchuktche-land, Billings says, "the whole country consists of barren valleys and naked hills, with no vegetation, except a scanty grey moss that springs from among the stones, and serves as food for the rein-deer. Only in a few valleys did I observe here and there a few stunted sand-willows. The climate is the most melancholy that can be imagined; before the 20th of July there is no symptom of summer, and on the 20th of August the winter sets in again. The mountains are numerous, many of considerable elevation. Not only on their summits, but even in the valleys and ravines, are seen masses of

snow that never melt. In the low country towards the north are many rivers of various sizes, running over a rocky bed. The valleys are for the most part marshy, and dotted with a number of small lakes. A few berries of different kinds grow scantily among the moss. On the eastern, north-eastern, and sometimes also on the southern coast, are caught walruses and seals. The quadrupeds are the rein-deer, the wild sheep, the white wolf, the bear, the common and the stone-fox. During the brief summer, eagles, hawks, grouse, and different kinds of water-fowl are seen; in winter, only crows, which follow the nomadic tribes."

Unfortunately, with the exception of a few religious ceremonies, Billings affords no ethnographical accounts of the Tchuktches. Yet such accounts would unquestionably have been the most interesting result of a journey attended with so many hardships, and of a daily intercourse of some months with a people of whom so little was known.

To conclude this general review of the Russian expeditions in the Polar Ocean, and along the north-eastern coast of Siberia, I will subjoin a brief account of the journey of M. Hedenström, the last before the scientific expeditions intrusted to Lieutenant Anjou and myself.

After the death of the merchant Liakhow, Sirovatskoi, another merchant, obtained a transfer of the exclusive privilege of deriving profit from the Liakhow Islands, and sent the citizen Sannikow there as his agent, who soon after his arrival, discovered to the west of the second, a new island, to which he gave the name of Stolbovoi Ostrow, or the Island of Columns. In 1805,

after Sirovatskoi's death, Sannikow discovered to the east of Kotelnoi Ostrow (Kettle Island) another island, which he named Fadejevskoi. In 1806, young Sirovatskoi, the son of the above-named merchant, discovered, not far from Fadejevskoi, another large island, which subsequently received the name of New Siberia.

The merchant Protodiakonow, who had several times started from the mouth of the Lena, in search of some new discovery, but hitherto in vain, addressed, about this time, a petition to government, to allow him and his partner Belkow,* to form a trading and hunting settlement, on Kotelnoi Island, and thereby in some measure to break through the Liakhow monopoly.

This application induced Count Nicolas Romanzow, the Chancellor of the Empire, a man of indefatigable activity in the promotion of everything beneficial to his country, to have a complete examination and survey of the Liakhow Islands made at his own expense; and this duty he intrusted to an able public officer, M. Hedenström, then residing at Iakutsk.

Hedenström went to Iakutsk in August, 1808, accompanied by Sannikow, and by a land-surveyor of the name of Koshevin. He was detained there by various necessary arrangements till the 18th of November, so that he was not able to reach Ustiansk before the 5th of February, 1809. The original plan was, that Kotelnoi Island should be the head-quarters of the expedition, where the stores should be deposited, and that excursions

* In 1808, shortly after this petition had been presented, Belkow discovered an island belonging to the same group. This island, which bears the name of its discoverer, is separated from the western shore of Kotelnoi, only by a narrow strait.

should be undertaken from thence to the several points of most importance. This plan was soon found impracticable, and other arrangements had to be made, occasioning delay; but notwithstanding these and other impediments, Hedenström was able to commence his operations in the spring of 1809.

His instruments, he informs us, consisted only of an octant, an old astrolabe, "not fit for taking latitudes," and a common ship's compass. To economize time, Hedenström divided the task between himself and his companions. Koshevin was directed to make the circuit of Fadejevskoi, and on his return, that of the first and second island. Sannikow was to survey the strait between Kotelnoi and Fadejevskoi. Hedenström himself proceeded to New Siberia, which, according to Sirovatskoi, was situated 300 wersts east of Fadejevskoi.

On the 7th of March, the expedition started in sledges from Ustiansk, and arrived at the first island, where they were detained six days by violent winds and snow-storms. They then went to Fadejevskoi, where they separated, each proceeding to the execution of the task assigned to him.

Koshevin completed the survey of the west, south, and east coasts of Fadejevskoi, and made the circuit of the first and second islands. Sannikow examined the strait between the two islands, and found the breadth to vary from seven to thirty wersts. Hedenström, who had undertaken to examine New Siberia, found the distance from Fadejevskoi only sixty-five, instead of three hundred, wersts. He surveyed the southern coast, to the extend of 220 wersts, and then returned to

Ustiansk, where his two companions had arrived three days before him. It was his intention to spend the summer in New Siberia, and to take with him horses and rein-deer. He accordingly sent Sannikow thither with some fur-hunters, to build a house, and to ascertain what subsistence they might be able to obtain for themselves and their cattle. Hedenström himself went to Verchoiansk, to make some necessary arrangements connected with the expedition.

In autumn, 1809, Hedenström returned to Ustiansk, where he found Sannikow, who had returned with his companions from New Siberia. They had erected, during their stay there, two winter-habitations, and three store-houses. The summer had been so cold, that in some places the snow had not even melted, and no grass was to be seen. Of fish they had found only the *Gasterotus aculeatus*, seven inches in length.* The absence of fish they supposed to have been occasioned by the rivers having been frozen throughout the summer, preventing the sea-fish from entering the streams. On Fadejevskoi Island, Sannikow found a Iukahir sledge, and a knife, such as is generally used for scraping rein-deer skins. The blade, however, was not of iron, but of a hard sharp flint. In New Siberia, they had found an axe made of the tusk of a mammoth. "This shows," observes Hedenström in his journal, "that Iukahirs must have dwelt in these islands, but at some remote period; for those now living in Siberia, have long been in the habit of obtaining from the Russians, by barter,

* This length would rather imply that it was the *Gasterotus spinochia*, or perhaps it may have been a new and unknown species.

as much iron as they want, and have completely given up the use of bones and stones in the construction of their tools."

Hedenström and his companions passed the winter at Possádskoïe Simovie, a winter-settlement on the coast, about 100 wersts east of Svätoi Noss, and 180 from the nearest settlement on the Indigirka, where his stores had previously been forwarded. A part of the time was spent in surveying the coast as far as the river just mentioned. "Our time," he says, "hung much less heavily on our hands, than is the case with many among the dissipations of a large city. Unfortunately, we suffered from scurvy, which generally prevails during the two months' night, when the air is dense, heavy, and unhealthy. The violent winds prevalent in this season purify the atmosphere in some degree, still it is absolutely necessary to take as much fresh food, and as much exercise in the open air, as possible. By observing these precautions, we succeeded in preventing this malady, so justly dreaded in the northern latitudes, from making progress. A Cossack and myself were the only two attacked, and by the use of a decoction of cedar, with constant exercise in the open air, we succeeded in getting the better of our sickness."

Hedenström left his winter-station, in January, 1810, and went to Ustiansk to make the necessary preparations for a second journey to New Siberia. Sannikow's account of the scantiness of the vegetation made him abandon all idea of taking horses there, and he determined first to ascertain whether New Siberia was an island, or part of a large continent, before he would take even rein-deer with him. He had completed his

preparations by the 2nd of March, when he departed from the mouth of the Indigirka, with twenty-nine sledges, directing his course towards a signal-cross, which he had erected the preceding year on Peszówoi Noss, the Cape of the Stone-foxes. On the 13th they reached the coast of New Siberia, about ten wersts west of the cross. "It is to the *Wood Hills*,"* observes Hedenström, "which we could see at the distance of 120 wersts, that we were indebted for having so well preserved our direction." The journey was extremely fatiguing, partly on account of the rugged hummocks, and partly because the dogs had been brought from the neighbourhood of the Indigirka, and had not been well broken in to the sledge. From the Cross Point, Hedenström sent back twenty-two of the sledges, which had chiefly been employed in conveying stores, and retained only

* Of these Hedenström observes, in another place, "On the southern coast of New Siberia are found the remarkable Wood Hills. They are 30 fathoms high, and consist of horizontal strata of sandstone, alternating with strata of bituminous beams or trunks of trees. On ascending these hills, fossilised charcoal is everywhere met with, covered apparently with ashes, but on closer examination, this ash is also found to be a petrifaction, and so hard, that it can scarcely be scraped off with a knife. On the summit another curiosity is found, namely, a long row of beams, resembling the former, but fixed perpendicularly in the sandstone. The ends, which project from seven to ten inches, are, for the greater part, broken. The whole has the appearance of a ruinous dike."—Lieutenant Anjou, who likewise examined these Wood Hills, says, "They are merely a steep declivity, twenty fathoms high, extending about five wersts along the coast. In this bank, which is exposed to the sea, beams or trunks of trees are found, generally in a horizontal position, but with great irregularity, fifty or more of them together, the largest being about ten inches in diameter. The wood is not very hard, is friable, has a black colour, and a slight gloss. When laid on the fire it does not burn with a flame, but glimmers, and emits a resinous odour."

the seven best, with which he continued the survey of the coast towards the east. Near Cape Peszówoi he found the variation 15° E. The latitude of that Cape he found to be 74° 45′, which is only 5′ less than according to Lieutenant Anjou's observations.

Sannikow went overland in a sledge, to examine the northern coast.

On the 16th of March, Hedenström was at Cape Kamennoy, (Rocky Cape,) whence the coast inclines to the west. "From the summit of this Cape, there was an appearance towards the north-east, that seemed to indicate the existence of land in that direction."

On the following day, Sannikow returned. He had gone seventy wersts due north, before he reached the north coast. He then proceeded towards the east, and spent the night above five wersts from the place where he joined Hedenström. Convinced now of the limited extent of New Siberia towards the east, Hedenström relinquished his original intention of spending a summer there. He sent Sannikov back to Ustiansk, and proceeded himself over the ice towards the north-east, to endeavour to ascertain something positive respecting the supposed land in that direction.

"Our journey was extremely fatiguing, but all our fatigues were forgotten, when we fancied we clearly distinguished the land through the telescope. It appeared to be a white line of coast, intersected by a multitude of rivulets. Shortly afterwards we perceived that the land in question took a semicircular direction, and appeared to be connected with New Siberia. Our joy at this discovery was great, but vanished on the following

morning, when we found that the supposed land was nothing but a range of enormous masses of ice, more than fifteen fathoms high."

Undiscouraged by this disappointment, Hedenström returned to New Siberia, for a fourteen days' stock of wood, and on the 24th of March, resumed his journey towards the east. He was not long, however, before he came to enormous hummocks, opposing so many impediments to his progress, that he was four days in going seventy wersts. "Here, to our astonishment," he says, "at the distance of five wersts, we saw the water completely open, with loose pieces of ice floating about. I subsequently ascertained, that this was an enormous polynia, extending from New Siberia to the Bear Islands, a distance of about 500 wersts."

Hedenström had intended to direct his course towards the signal-tower erected by Laptew at the mouth of the Kolyma. He endeavoured therefore to find a passage over the polynia, in various places; but at last, convinced that this was impossible, he proceeded southward, reached the main-land of Asia, near the mouth of the Kuradjina River, and arrived at the tower on the 13th of April, having been forty-three days on the way. As he had provided himself only for twenty-eight days, it may easily be imagined what his sufferings would have been, had he not had the good fortune to kill eleven white bears, which provided him at least with food for his dogs.

On the 18th of April Hedenström left Nijnei Kolymsk with five fresh sledges, and provisions for twenty days, after he had sent the land-surveyor, Pschenizyn (sent to him in place of

Koshevin, who had fallen sick,) to survey Kotelnoi Island. Near the Baranov Rocks Hedenström was detained a week by a violent storm from the east. Having proceeded 150 wersts, N. 20° E., he observed fragments of soil on the ice. "On the 1st of May we saw a flight of geese, going N.N.W., and a white owl.* In the north were clouds, the depth of the water lessened, and everything seemed to indicate the approach of land. About 245 wersts from the Baranov Rocks we had to pass a fissure in the ice, two feet and one-third in breadth; but five wersts further we came to one fifteen fathoms broad. Here I observed a strong current running E.S.E., whence I concluded that the fissure had been occasioned by the late storm from the east. During the last five wersts the soundings diminished from eleven and a-half to eleven fathoms."

I may be allowed here to compare these statements with my own observations, made in the same place, ten years afterwards. The direction in which Hedenström drove was N. 20° E. and correcting this by the variation of the compass (15° E.), it follows that in 1821 and 1822, we went over the same line. In this direction, 150 wersts from the Baranov Rocks, Hedenström found fragments of soil among the ice. This was exactly the spot whence, in 1821, we turned off to the S.E.; and the fissures in the ice, which he met with 245 wersts further, must have been in the same place where, in 1822, we encountered open polynias and hummocks, and where we formed our second provision-depôt.

* The Styrx nyctea, or Snowy Owl; the other Siberian species of this genus never leave the forest region.

after Sirovatskoi's death, Sannikow discovered to the east of Kotelnoi Ostrow (Kettle Island) another island, which he named Fadejevskoi. In 1806, young Sirovatskoi, the son of the above-named merchant, discovered, not far from Fadejevskoi, another large island, which subsequently received the name of New Siberia.

The merchant Protodiakonow, who had several times started from the mouth of the Lena, in search of some new discovery, but hitherto in vain, addressed, about this time, a petition to government, to allow him and his partner Belkow,* to form a trading and hunting settlement, on Kotelnoi Island, and thereby in some measure to break through the Liakhow monopoly.

This application induced Count Nicolas Romanzow, the Chancellor of the Empire, a man of indefatigable activity in the promotion of everything beneficial to his country, to have a complete examination and survey of the Liakhow Islands made at his own expense; and this duty he intrusted to an able public officer, M. Hedenström, then residing at Iakutsk.

Hedenström went to Iakutsk in August, 1808, accompanied by Sannikow, and by a land-surveyor of the name of Koshevin. He was detained there by various necessary arrangements till the 18th of November, so that he was not able to reach Ustiansk before the 5th of February, 1809. The original plan was, that Kotelnoi Island should be the head-quarters of the expedition, where the stores should be deposited, and that excursions

* In 1808, shortly after this petition had been presented, Belkow discovered an island belonging to the same group. This island, which bears the name of its discoverer, is separated from the western shore of Kotelnoi, only by a narrow strait.

should be undertaken from thence to the several points of most importance. This plan was soon found impracticable, and other arrangements had to be made, occasioning delay; but notwithstanding these and other impediments, Hedenström was able to commence his operations in the spring of 1809.

His instruments, he informs us, consisted only of an octant, an old astrolabe, "not fit for taking latitudes," and a common ship's compass. To economize time, Hedenström divided the task between himself and his companions. Koshevin was directed to make the circuit of Fadejevskoi, and on his return, that of the first and second island. Sannikow was to survey the strait between Kotelnoi and Fadejevskoi. Hedenström himself proceeded to New Siberia, which, according to Sirovatskoi, was situated 300 wersts east of Fadejevskoi.

On the 7th of March, the expedition started in sledges from Ustiansk, and arrived at the first island, where they were detained six days by violent winds and snow-storms. They then went to Fadejevskoi, where they separated, each proceeding to the execution of the task assigned to him.

Koshevin completed the survey of the west, south, and east coasts of Fadejevskoi, and made the circuit of the first and second islands. Sannikow examined the strait between the two islands, and found the breadth to vary from seven to thirty wersts. Hedenström, who had undertaken to examine New Siberia, found the distance from Fadejevskoi only sixty-five, instead of three hundred, wersts. He surveyed the southern coast, to the extend of 220 wersts, and then returned to

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pass, to try whether it would not be possible to get round the Great Polynia, which, as we have seen above, extends from New Siberia in the direction of the Kolyma.

Business forced Hedenström that winter to go to Verchoiansk, where he found an order from the governor of Iakutsk, to repair to him immediately, to furnish a personal report of what had hitherto been effected. He arrived at Iakutsk on the 4th of January, 1811, when the governor informed him that the expedition pressed too heavily on the poor and scanty population of the coast of the Polar Ocean, and that he (the governor) had sent remonstrances on the subject, and was then in expectation of the decision of the Government. After Hedenström had furnished a detailed report of his labours, it was resolved to leave the further survey of the islands to the Geodet Pschenizyn, assisted by Sannikow, Tatarinow, and the non-commissioned officer Reschetnikow. A report of Pschenizyn's survey accompanies Hedenström's journal as an appendix, the principal points of which are the following:

Pschenizyn went, early in March, 1811, with sledges from the Russian mouth of the Iana to New Siberia, and completed the survey of that island, the circumference of which he estimated at 470 wersts. The northern coast consists, generally, of lofty and precipitous rocks of sandstone. There is very little drift-wood on the north side of the island, whereas, on the southern coast, it is found in two bays, in the greatest abundance. Tatarinow, in obedience to his orders, started from Cape Kammennoy, in the direction of the Great Polynia; but, at the end of the first twenty-five wersts, found the ice so thin, that he did not

venture to go further. Immediately beyond this thin crust of ice, he saw open water, completely free from ice. Sannikow started for Fadejevskoi, and commenced its survey on the 27th of March. He found what had hitherto been supposed to be a strait, to be only a deep inlet on the western coast. From the upper end of this inlet, there extends a flat sand-bank, connecting the two islands of Fadejevskoi and Kotelnoi. The north-west point of the former consists of a lofty narrow ridge of rocks, behind which the coast suddenly bends to the east and south-east, forming a bay. From the northern coast Sannikow saw land further to the north with high mountains, and set out to explore it; but after he had proceeded twenty-five wersts over the ice, he came to a large open polynia, extending on every side. He thought he saw the land quite distinctly, and estimated the distance at about twenty-four wersts from the place where his progrees had been arrested, and about forty-five wersts from Fadejevskoi Island. He made another attempt to go due north from Cape Blagovichenie, but was again stopt by open water. On the 12th of April, he returned to Ustiansk, to send rein-deer and other supplies to Kotelnoi, where he intended to pass the summer. This party, taking with them twenty-three rein-deer, set off on the 2nd of May, and arrived there before the end of the month, with great difficulty, owing to the many fissures already formed in the ice, and to the quantity of sea-salt, that, in consequence, had been deposited on it. Another party, intended to join Pschenizyn, on the island of Fadejevskoi, could not arrive, and that officer was thus placed in a most disagreeable position.

Sannikow's rein-deer were greatly exhausted by the long and painful march, but they soon recovered, and on the 25th of June he set out to examine the part of the island that was still unknown. Pasturage for the rein-deer being but seldom found along the coast, and the eastern and western sides having already been examined, he determined to cross the island, and return, by a circuit, to the point to which the examination of the coast had previously extended. He drove up the Czar River and down the Sannikow River, and then followed the coast as closely as the nature of the pasturage grounds would allow, making the complete circuit of the island. This excursion occupied fifty-four days; the party returned to their settlement on the 17th of August, having subsisted on geese, and on wild rein-deer caught by one of their companions, a Iukahir, by means of rein-deer trained for the purpose.

On the hills in the interior of the island, Sannikow found the skulls and bones of horses, buffaloes, oxen, and sheep, in such abundance, that these animals must formerly have lived there in large herds. At present, however, the icy wilderness produces nothing that could afford them nourishment, nor would they be able to endure the climate. Sannikow concludes that a milder climate must formerly have prevailed here, and that these animals may therefore have been contemporary with the mammoth, whose remains are found in every part of the island. Another circumstance, whence he infers a change in the climate, is the frequent occurrence, here, as well as in the island of New Siberia, of large trees partially fossilised.

The remains of numerous Iukahir huts, scattered over the island, appear to confirm a tradition generally current at Ustiansk and along the Indigirka, that, about 150 years ago, a large emigration of this tribe took place, in consequence of the small-pox, which then raged with great violence ; the fugitives are supposed to have sought refuge in these islands, or perhaps in some still undiscovered country in the Polar Ocean. In addition to fossil and bituminous wood, they found on the eastern side, along the sandy banks of the Sannikow River, some very beautiful ammonites, in large balls of hard clay. These ammonites shone like mother-of-pearl. The ribs of whales also were frequently seen on the west coast, whereas, they are never, or at all events very rarely, met with on the north coast of Siberia.* On the 4th of October, Sannikow set out to examine the sand-bank on the east side of Kotelnoi Island, and to pass from it to Fadejevskoi, to seek for Pschenizyn, who had left Ustiansk about the end of April with Tatarinow and a few other companions. He waited for some time at the winter habitation in Fadejevskoi, in expectation of rein-deer that were to have been sent after him, but as they did not arrive, he determined to set out on foot. With all his exertions, he was unable to proceed more than fifty wersts, before he was compelled to return and await the winter, when he might hope to reach either the mainland, or the island of Kotelnoi. He had expected that his dogs would have been able to subsist during the summer on the mice,

* From the accounts of voyages of the eighteenth century, the appearance of whales in this part of the Polar Ocean would seem to have been at that time of much more frequent occurrence.

which they are in the habit of catching, and had brought with him only as much food for them, as he calculated he should require on his return. Unfortunately the mice had migrated;* and in consequence, the greater part of his dogs died, and those that remained were so weak and exhausted, that they were utterly unfit to perform the journey back. Pschenizyn himself, and his companions, had likewise suffered much from a scarcity of provisions. Such was the situation in which Sannikow found them on his arrival, on the 6th of October. He shared with them his own not very abundant stores, and, after three days' repose, the whole party set off for Kotelnoi Island, where they arrived on the 13th. Here, from Sannikow's manuscript notes and personal explanations, Pschenizyn drew up a map of the island, and a journal of the whole expedition. On the 27th of October, they set out on their return, which was attended by many perils, the ice being still very thin, and in many places open. Sannikow's experience, however, and presence of mind, surmounted every obstacle; and on the 12th of November they all reached Ustiansk with their rein-deer. Sannikow went to Iakutsk to make his report, and was followed by Pschenizyn, after he had settled his accounts with the inhabitants of Ustiansk for the supplies furnished to the expedition.

Thus ended Hedenström's undertaking, remarkable in many points of view, and highly creditable to the zeal with which he met its difficulties and dangers. In conclusion, I will

* The mice often migrate in large numbers from one island to another, and sometimes even to the continent of Asia.

subjoin a few of his remarks on the natural history of these icy regions.

The shores of the Polar Ocean, from the Lena to Behring Straits are, for the most part, low and flat, rising so little above the level of the sea, that in winter it is difficult to discover where the land terminates. A few wersts inland, however, a line of high ground runs parallel with the present coast, and formerly, no doubt, constituted the boundary of the ocean. This belief is strengthened by the quantity of decayed wood found on the upper level, and also by the shoals that run far out to sea, and are probably destined, at some future period, to become dry land. On these shoals, during the winter, lofty hummocks fix themselves, forming a kind of bulwark along the low shore, and often remaining there the whole summer without melting. The banks of the rivers and lakes in the interior, on the other hand, are bold and precipitous, and present a singular geological phenomenon, in their regular alternate strata of ice and soil, and the veins of ice that run through them in different directions.

The nearer the Arctic shore is approached, the more scanty and diminutive the trees become. As far as Verchoiansk larch trees of good size are still found. Beyond the 70th degree neither trees nor shrubs are met with.

He gives some interesting particulars respecting the mammoth-bones, the peculiar production of Siberia, and more particularly of the northern islands. According to his account, these bones or tusks, are less large and heavy the further we advance towards the north, so that it is a rare occurrence on the islands to meet with a tusk of more than three pood in weight, whereas on the

continent, they are said to weigh often as much as twelve pood. In quantity, however, these bones increase wonderfully to the northward, and as Sannikow expresses himself, *the whole soil of the first of the Liakhow Islands appears to consist of them.* For about eighty years the fur-hunters have every year brought large cargoes from this island, but as yet there is no sensible diminution of the stock. The tusks on the islands are also much more fresh and white than those of the continent. A sand-bank on the western side was most productive of all, and the fur-hunters maintain, that when the sea recedes after a long continuance of easterly winds, a fresh supply of mammoth-bones is always found to have been washed upon this bank, proceeding apparently from some vast store at the bottom of the sea.

In addition to the mammoth, the remains of two other unknown animals are found along the shore of the Polar Ocean. The head of one of these bears a strong resemblance to that of the rein-deer; differing from it in the size and form of the antlers, which descend and turn up towards the extremity. The head of the other animal is generally thirty-one inches long, and twelve inches broad; the nose is bent downward, and shows several rows of bony excrescences. Near these last-named skulls something like the claw of an enormous bird is generally found. These claws are often three English feet long, flat above, but pointed below, the section presenting a triangle. They appear to have been divided into joints throughout their whole length, like the claws of a bird. The Iukahirs, who make use of these horny claws to give increased force to their bows, maintain that the head and claws have both

belonged to an enormous bird, respecting which they relate a number of marvellous stories.*

Hedenström's astronomical and geographical determinations are not often to be depended on, owing, no doubt, to the want of good instruments, and skilful assistants. Thus, for instance, he states the latitude of Svätoi Noss at one degree less than Laptew and Anjou. On many other points the coast is given half a degree more to the south than it was found to be on the occasion of the recent more careful observations. To the northern islands much too great an extent of longitude was assigned by him. Thus from the western point of Kotelnoi Island to the eastern cape of New Siberia, comprises, on Hedenström's map, a distance of 285 miles; whereas the real distance, was found by the survey of Lieutenant Anjou, to be only 205 miles.

II.—*On the Ice of the Polar Sea.—The Polynia or open water.—Currents.—Gain of the Land on the Sea.—The Aurora Borealis. On the best kind of Sledges, and on the treatment of the Dogs.*

The fur-hunters, who visit New Siberia and Kotelnoi Island every year and pass the summer there, have observed that the space between

* Dr. Kyber had frequent opportunities of examining these supposed heads and claws of a bird, and believes them to be the remains of a species of rhinoceros.

those islands and the continent is never completely frozen over before the last days of October, although fixed ice forms along the coasts at a much earlier period. In spring, on the other hand, the coasts are quite free by the end of June, whereas, at a greater distance from land, the icy covering continues firm a full month later, and would probably remain so still longer, if it were not weakened by the multitude of cracks which are formed in the spring, and some even in winter. Throughout the summer the sea is covered with fields of ice of various sizes, drifted to and fro by the winds and currents, and when the sea is agitated by storms these offer a magnificent spectacle.

The ice which the larger rivers bring down every year is never entirely melted in the same year, either by the action of the sun or by that of the sea. When the ice melts, a quantity of heat is absorbed, and the temperature is kept down. This yearly accession of river-ice might be expected gradually to augment the quantity of ice in the Polar Sea; and it would seem that this is the case, from what the inhabitants of the coast near Cape North affirmed, namely, that formerly the sea in the neighbourhood of the Cape used to be free from ice in summer, which is now seldom the case. It was so in 1820, but this was regarded as a rare exception. In winter, the surface of the Polar Sea resembles on a smaller scale, that of the steppes or tundras of the continent, the hummocks taking the place of the hills and mountains on the land, the open spaces (or polynias) and the fissures, that of the lakes and rivers.

In the summer and autumn the ice breaks up

into fields, and lanes of open water between them are met with near the land, as well as near the open sea: the action of the wind at this period, in driving the fields against each other, forms what are called autumn hummocks, which are usually about six feet high, and consist of pieces which are pointed and sharp. Winter hummocks are formed in the same manner where lanes of water exist, which at that period is only in the vicinity of the open sea, and usually parallel with the external margin of the ice; these hummocks are generally therefore in ridges, preserving the same direction. There are none of this description between the islands of New Siberia and the continent, nor have the ridges in that quarter any usual or determinate direction. Winter hummocks are frequently 100 feet in height, sometimes with one perpendicular and one sloping side, as described in page 144, and at others, with declivities on both sides: they are formed of a great number of pieces of all sizes, heaped together, amongst which are occasionally fragments of very old ice. The colour of the ice is either bluish-green, or a clear white; the former is the sea-water congealed; the latter is the snow which has fallen on its surface, pressed by its own weight, and cemented by occasional partial thawing and freezing afresh. The congealed sea-water is either fresh, in which case it is more blue and transparent; or bitter, when it is much less transparent, of a greenish-blue, and without air-bubbles. Some of the autumn ice is of a dirty grey colour and opake; this is formed in shoal and muddy water. The thickness of the ice produced in a single winter is about nine and a-half feet; an exposure to a second winter

will add about five feet more, and doubtless a third winter will add more still; but masses are formed of 150 feet and upwards in depth; these consist of fragments packed on each other by the force of the wind and waves, and cemented together; the process of their formation is frequently evidenced by intermediate layers of white and opake ice, composed of the snow which was originally on the surface of the now imbedded fragments.

Wherever the ice is formed from sea-water, and its surface is clear of snow, the salt of the sea may be found deposited in crystals which are called Rassöl; in the neighbourhood of the polynias the layer of salt is frequently of considerable thickness. It is a great impediment to draft, acting like so much coarse sand: though bitter in flavour, and not devoid of medicinal qualities, the fur-hunters use it instead of other salt, on their journeys to and from the islands of New Siberia.

The Great Polynia, or the part of the Polar Ocean which is always an open sea, is met with about twenty-five wersts north of the islands of Kotelnoi and New Siberia, and from thence in a more or less direct line, to about the same distance off the coast of the continent, between Cape Chelagskoi and Cape North. Tatarinow, who accompanied the surveyor Pschenitzyn to New Siberia in April 1811, found an open sea about twenty-five wersts north of that island; as did Hedenström in 1810, about seventy wersts east of it: Lieutenant von Anjou, in 1823, traced the boundary of the open sea some miles to the north of these islands, as is shown by his track in the map annexed to this work: our several

journeys have related the various instances in which we encountered either the open sea itself or the very thin ice indicative of its immediate vicinity, at different points of the general boundary line above described: the Tchuktches who live near Cape North, when speaking of the polynia in that neighbourhood, added, that the shore-ice usually extends somewhat further seaward about Cape North than about Cape Jakan. Our frequent experience, that north and north-west winds, and often north-east winds also, are damp to a degree which was sufficient to wet our clothes, is also a corroboration of the existence of an open sea at no great distance in those directions.

During the summer, the current between Svätoi Noss and Koliutchin Island is from east to west, and in autumn, from west to east. This is confirmed by the relations of Liakhow in 1773, Schalarov in 1762, and Billings in 1787. The Tchuktches also told us, that in summer the ice drifts rapidly along the coast to the west, and in autumn to the east. The prevalence of N.W. winds is doubtless the occasion of the S.E. current, which we frequently observed in the spring.

It has been noticed in the narrative, and may be seen by the map, that in the part of the Polar Sea over which we travelled, the water deepens almost imperceptibly in going towards the north, but much more rapidly in going towards the east. the bottom was everywhere soft, except in a single instance in 72° 03′ N. and 166° 12′ E. where we found a rocky bottom.

The inhabitants of the north coast of Siberia generally believe that the land is gaining on the sea: this belief is chiefly founded on the quantity

of long-weathered drift-wood which is now to be met with on the tundras and in the valleys, at a distance of fifty wersts from the present sea-line, and decidedly above its level. In no circumstances of weather is either sea-water or ice now ever known to come so far inland. In Schalarov's map, Diomed Island is marked as separated from the main land to the east of Svätoi Noss by a sea-channel; no such channel of separation now exists. It may be useful towards future researches of this nature to state, that on Wiliginsk sandbank, near the lesser Baranov Rock, there is a single column of rock, the summit of which in May 1822, was thirty English feet in vertical height above the frozen surface of the sea.

The general characteristics of the Aurora Borealis are so well known that it is unnecessary to describe them here; I will therefore confine myself to the following particulars which appear to deserve a special notice.

1. When the streamers rise high and approach the full moon, a luminous circle of from 20° to 30° is frequently formed round it; the circle continues for a time, and then disappears.

2. When the streamers extend to the zenith, or nearly so, they sometimes resolve themselves into small, faintly luminous, and cloudlike patches, of a milk-white colour, and which, not unfrequently continue to be visible on the following day, in the shape of white wave-like clouds.

3. We often saw on the northern horizon, below the auroral light, dark blue clouds, which bear a great resemblance in colour and form, to the vapours which usually rise from a sudden break in the ice of the sea.

4. Even during the most brilliant Auroras, we could never perceive any considerable noise, but in such cases we did hear a slight hissing sound, as when the wind blows on a flame.

5. The Auroras seen from Nijnei Kolymsk usually commence in the north-eastern quarter of the heavens; and the middle of the space which they occupy in the northern horizon, is generally 10° or 20° east of true north. The magnetic variation at this place is about 10° east.

6. Auroras are more frequent and more brilliant on the sea-coast than at a distance from it. The latitude of the place does not otherwise influence them. Thus for example, it would seem from the accounts of the Tchuktches, that in Koliutchin Island, (in 67° 26′ latitude,) Auroras are much more frequent and more brilliant than at Nijnei Kolymsk, in latitude 68° 32′. On the coast we often saw the streamers shoot up to the zenith; whereas, this was rarely the case at Nijnei Kolymsk; nor was the light nearly so brilliant at the latter place.

7. The inhabitants of the coast affirm, that after a brilliant Aurora they always have a strong gale from the quarter in which it appeared; we did not observe this to be the case at Nijnei Kolymsk. The difference, however, may proceed from local circumstances, which often either prevent the sea-winds from reaching so far inland, or alter their direction; for example, it often happens that there is a strong northerly wind at Pochodsk, seventy wersts north of Kolymsk, whilst at the latter place the wind is southerly.

8. The finest Auroras always appear at the beginning of strong gales in November and January; when the cold is most intense, they are more rare.

9. A remarkable phenomenon which I often witnessed deserves to be recorded, i. e. when shooting stars fell near the lower portion of an auroral arch, fresh kindled streamers instantly appeared, and shot up from the spot where the star fell.

From some of the above remarks it may be inferred that the freezing of the sea may be connected with the appearance of Auroras. Perhaps a great quantity of electricity may be produced by the suddenly rising vapours, or by the friction of large masses of ice against each other.

The Aurora does not always occupy the higher regions of the atmosphere; it is usually nearer the surface of the earth, and this is shown by the visible influence of the lower current of the atmosphere, on the beams of the Aurora: we have frequently seen the effect of the wind on the streamers as obvious as it is on clouds; and it is almost always the wind which is blowing at the surface of the earth.

I propose to give a few details, supplementary to those contained in the narrative, respecting the rules to be adopted in regard to sledges and dogs, as they may be useful to future travellers, and are all derived from our own, and sometimes from dear-bought, experience.

The Narti, or sledges of Northern Siberia, are not made according to any uniform pattern: those which we found to be the best for our journies over the Polar Sea had the following dimensions: length of the runners $2\frac{1}{2}$ arschins, or about 5 feet 10 inches English: breadth of the sledge $\frac{3}{4}$ of an arschin, or 1 foot 9 inches: height from the runners to the upper part 6 werschok, or $10\frac{1}{4}$ inches. The best material is birch-wood, and the pieces

ought to be selected as free from knots as possible, that they may wear uniformly, otherwise the softer parts become worn away, leaving the harder ones to project, so as greatly to impede the gliding of the sledge.

The upper surface, on which the lading is placed, is formed of the long flexible shoots of the sand-willows woven together.

In order to render the wooden runners more tough and durable, they should first be softened in boiling water, and then placed for a month or more under the ice in running water. When thoroughly saturated they should be taken out during a severe frost, when they will be perfectly smooth and hard. No iron whatever is used in the construction of the sledge, all the parts (with the exception of the upper wicker work), are merely fastened together with thongs, which tends greatly to prevent fracture in travelling over rugged paths, and in ascending and descending the hummocks.

The wodiat, or artificial crust of ice under the runners, has been described in p. 97. When the wodiat is thick (half an inch) and strong, 35 pood, or 1260 lb. avoirdupois may be placed on each sledge in spring, but in intense winter cold, 10 pood, or 360 lb. is sometimes a heavy load for the dogs. For journeys over the ice of the sea, spare runners ought always to be taken, as well as spare pieces to replace some of the other parts of the sledge: pieces of whalebone should also be carried for the purpose of replacing, towards the end of April and beginning of May, the wodiat, which then ceases to be available. The best time of the whole year for sledging is the month of March; when the cold equals or exceeds —25°, the draft

is much more heavy, and when it is —40°, the friction is greatly increased from the hard and granular state of the snow.

Good thongs to be used in the construction of sledges, may be made of elk, ox, or walrus-skin; the first are very good but scarce, and the preparation of ox-leather is ill-understood; walrus-skin is most frequently used, and is very durable. The whole of the lading of a sledge should be wrapped in a covering of soft rein-deer skin, and bound so strongly to the sledge with thongs as to be quite secure from displacement in the overturns which frequently occur. A complete sledge of large size and drawn by twelve or thirteen dogs requires, including the harness and the binding of the lading, 760 feet of thongs of various breadths.

The choice of dogs is a most material point. A team ought always to be well accustomed to draw together; the dogs appear to learn how best to aid each other, by which they are saved much fatigue, and their driver much trouble. The dogs of the Iana and Indigirka are preferable to those of the Kolyma on this account, and also because they are used to much longer journeys both over the ice to New Siberia, and over the tundras. A well-loaded sledge requires twelve dogs, but the foremost sledge should have one more, which should be trained as a leader with great and peculiar care, that he may neither be liable to be tempted from the route by the scent of game, nor turned aside by any difficulty: but may swim across open places when necessary. The importance of a good leader even for a single team and in ordinary sledging has been spoken of in Chapter III.

Dogs that are to be used for a distant journey,

ought to be treated with great care for a long time beforehand, and to be allowed good food and rest; when this has been done, they usually show the good condition they are in by changing the whole of their coat in summer, which is only partially the case with weak and ill-kept dogs. When winter has set in, and the time for travelling approaches, they should be carefully prepared for it. For a fortnight previous to their first journey, they must be put on a smaller allowance of hard food, to convert their superfluous fat into firmer flesh. They are at the same time to be exercised, by being driven from ten, to at the outside thirty wersts, halting and resting regularly every four or five wersts. After such a preparation, they may be driven as much as 150 wersts a-day without being injured by it, providing the journey is not of very long continuance, and the cold is not very great; in such cases the days' journeys must be proportionably shortened.

In order to be more sure that none of the necessary precautions were omitted, we attended to them ourselves; and previous to our long ice-journeys, we had the dogs collected at a proper place about a fortnight before starting, and saw all the rules of diet and exercise observed. The drivers at such times gave them their food raw and cooked on alternate days.

In winter journeys, it is advisable, as far as possible, to allow the dogs fresh frozen fish, thawed and cut into pieces, instead of dried fish; but the latter does perfectly well in spring, when the weather is milder; ten good frozen herrings are a proper daily allowance for each dog. Dried fish are lighter for transport.

On first starting, we used to drive about forty wersts a-day along the coast, when the path was good; in returning, we often drove at the rate of sixty wersts, and during the last twenty days, sometimes at that of 100 wersts a-day. When the weather is very severe, the dogs ought to be allowed a day's rest after every two or three; but in milder weather once a-week is sufficient. Sometimes towards the end of the journey, we travelled several days together, without the dogs being injured by it. Generally speaking, the quantity of rest allowed, ought to be in proportion to the strength of the dogs, and to the length of time during which they have still to travel. It is most essential to spare them during the early part of the journey; towards its conclusion they may be worked harder, and may even, if necessary, be given less food. When they are in good travelling condition, they may very well run for an hour or an hour and a-half in very cold weather, and for three hours in mild weather, without stopping; making a halt of ten or twenty minutes at the expiration of these intervals. The general rule after a day's journey is not to feed them until they have had two or three hours' rest, but if they are very much exhausted, warm food should be given as soon after their arrival as it can be prepared. A small piece of fish is sometimes given to them during their short halts. On long journeys they are liable to become footsore; and as this will sometimes render them unserviceable for a full month, the greatest care should be taken to avoid it. As soon as any blood is seen on the paws, they should be frequently washed in strong brandy, and if the

weather is mild, bathed in sea-water; fur boots are used at such times with advantage.

When a dog is overworked, it is customary to bleed him in the tail or ears. When on the track of a deer or bear, the dogs will run fifteen wersts, and even more, in an hour; but this must not be regarded as a travelling pace.

III.—*General remarks on the Winds.*

North wind is seldom fresh or of long-continuance; is more frequent in summer than in winter, when it often brings mist and milder weather, but in summer it brings cold.

North-east wind, or more often E.N.E., is seldom of long continuance and violent. It usually clears the atmosphere from mist, and thus causes the thermometer to rise in summer and to fall in winter. Auroras often accompany this wind in winter.

South-east wind drives away mist, and may be regarded as the prevailing wind in autumn and winter. Sometimes in the middle of winter, a wind from the S.E. by E., or S.E. $\frac{1}{2}$ E. causes the temperature to rise suddenly from — 24° to + 25°, or even to 32°; previously to this, the barometer sinks as much as four-tenths of an inch in the course of eight hours. The S.S.E. wind has no particular influence, either on the barometer or thermometer. S.E. winds, but more

particularly E. by S., and E. winds are frequently accompanied by Auroras.

South winds seldom blow with much force; they bring clouds, and have no particular influence on either the barometer or thermometer.

South-west wind seldom blows with much force, and has not much effect on the temperature; nevertheless, in winter it is much felt, and is the most piercing of all winds. The natives have a particular name for it—Schalonnik.

West and north-west winds.—These are the prevailing winds on the general average of the year; in winter, the S.E. prevail, in summer, N.W.; and the N.W. blows often in winter also. The wind is accounted more likely to be steady when in the N.W. quarter than in others; in summer it is a cold wind; in winter it brings snow, and bad weather. By the direction of the lines of drifted snow lying on the frozen surface of the ice, it appears that W.N.W. and E.S.E. winds are the most prevalent.

IV.—GEOGRAPHICAL POSITIONS, and MAGNETIC INCLINATIONS and DECLINATIONS, determined by the expedition under M. von Wrangell.

Place.	Lat. N.	Long. E. from Greenwich.	Method.	Observer.	Magnetic Inclination North.	Magnetic Declination East.
	° ′ ″	° ′			° ′	° ′
Ostrog of Nijnei Kolymsk	68 31 53	160 56	☽—⊙	Wrangell Matiuschkin, Kosmin.	77 26	9 56
On the Kolyma.						
Mouth of the Krutoi	68 37 57	161 08	△	Wrangell.		
Mouth of the Ambolicha	68 40 52	161 20	△	Do.		
Village of Pantelejewsk	68 35 51	161 32	△	Do.		
Village of Karetowsk	68 47 27	161 11	△	Do.		
Village of Tschernoussow	68 50 20	161 13	△	Do.		
Village of Pochodsk	69 04 21	160 55	△	Do.	..	11 45
Village of the Lesser Tchukotskia	69 26 10	160 23	△	Do.		
Kabatschkowo	69 17 30	161 23	△	Do.		
Sucharnoi	69 31 25	161 44	△	Do.		
Steep declivity near the Tchukotskia River	70 06 45	159 48	△	Do.		
West summit of the White Rocks	68 33 30	162 04	△	Do.		
West summit of the Pantelejiva Mountain	68 37 57	161 40	△	Do.		
West summit of Surowoi	68 43 20	161 29	△	Do.		
Larionow Rock	69 03 15	161 39	△	Do.		
Sredni Kolymsk	67 26 20			Kosmin.		
Ostrog of Verkni Kolymsk	65 42 04			Do.		
Sleeping Place on the Omekon	63 15 15	142 48	R	Do.		

Place.	Lat. N.	Long. E. from Greenwich.	Method.	Observer.	Magnetic Inclination North.	Magnetic Declination East.
	° ′ ″	° ′			° ′	° ′
On the Sea Coast, between the Kolyma and the Indigirka.						
Krestowoi, west point of the mouth of the Kolyma	70 17 00	159 55	△	Kosmin		
Cape, near the Greater Tchukotskia River	70 07 00	159 50	△	Do.		
Mouth of the Prokopii	70 27 44	159 43	△	Do.		
Mouth of the Krestowoi	70 43 33	159 15	△	Do.		
Mouth of the Kuradajina	70 53 37	158 56	☽—⊙	Do.		
The Northern Parnassus	71 00 56	158 10	△	Do.		
Steep declivity of the Kuropatosh, 14th July	71 03 54	157 23	△	Do.		
Point of the 15th July	71 04 20	156 26	△	Do.		
Point of the 16th July	70 56 48	155 31	△	Do.		
Point of the 17th July	70 58 11	154 45	△	Do.		
Point of the 18th July	70 53 48	154 13	△	Do.		
Mouth of an arm of the Alaseia, 19th July	70 50 14	153 43	△	Do.		
Mouth of an arm of the Lesser Alaseia, 21st July	70 48 48	153 00	☽—⊙	Do.		
Russian Settlement on the Indigirka	71 00 19	149 31	☽—⊙	Do.	..	9 58
Bear Islands, N.W. point of No. I.	70 52 14	160 24	△	Wrangell		
——— N. point of No. IV.	70 46 35	161 40	△	Matiuschkin	..	14 00
——— S. E. point of ———	70 37 06	162 24	△	Do.	79 49	14 06

Place.	Lat. N.	Long. E. from Greenwich.	Method.	Observer.	Magnetic Inclination North.	Magnetic Declination East.
	° ′ ″	° ′			° ′	° ′
On the Sea Coast, East of the Kolyma.						
Bear Cape, E. point of the mouth of the Kolyma	69 41 00	162 14	△	Wrangell and Kosmin.		
The Lesser Baranov Cross	69 38 00	162 27	△	Do.	..	12 30
Northernmost point of the Lesser Baranov	69 41 48	162 56	△	Do.		
July 9th, between the Greater and Lesser Baranov	69 40 34	163 33	△	Do.	..	12 35
N.E. point of the Greater Baranov	69 43 55	163 51	△	Do.		
Mouth of the Krestowoia	69 36 06	164 14	△	Do.		
Mouth of the Beresowaia	69 30 50	165 14	R	Matiuschkin		
Mouth of a stream, 26th February	69 32 30	166 19	☽—⊙	Wrangell and Kosmin.		
Halting place near the Great Baranika River	69 30 41	166 41	☽—⊙	Do.	..	15 26
Mouth of the Kosmina	69 32 15	167 20	△	Kosmin.		
Point of the 24th February	69 37 58	164 09	△	Wrangell.		
Point of the 26th February	69 34 22	165 44	△	Do.		
Night halt of the 26th February	69 32 30	166 20	△	Kosmin.		
Mouth of a stream, 7th April, 1823	69 34 51	168 17	△	Matiuschkin.		
Wyteknoie Lake, 4th August	69 33 11	167 32	△	Do.		
Tchaun Bay, 8th August	69 25 16	168 17	△	Do.		
Point of the Vojvaiuna Mountain	69 06	168 46	△	Do.		

Place.	Lat. N.	Long. E. from Greenwich.	Method.	Observer.	Magnetic Inclination North.	Magnetic Declination East.
	° ′ ″	° ′			° ′	° ′
Point of the 27th February	69 30 17	166 42	R	Wrangell and Kosmin.		
Mouth of a stream, 28th February	69 37 37	167 47	☽—⊙	Do.		
Point of 1st of March	69 42 40	167 38	R	Do.		
Night halt of 1st of March	69 48 22	167 50	☽—⊙	Do.		
Point of 2nd March	69 52 56	167 56	R	Wrangell.		
North point of Sabadei or Aiun Island, 2nd March	69 57 17	168 40	△	Do.		
East point of Ditto, 2nd March	69 56 32			Matiuschkin.		
Pointed cape in the Sabadei Strait	68 43 28	168 10	R	Wrangell.		
South point of Cape Matiuschkin	69 35 00	170 41	△	Do.		
Mountain on Cape Matiuschkin	69 36 00	170 42	△	Do.		
Cape Matiuschkin	69 43 18	170 53	△	Do.		
Point of 8th March	69 44 43	170 43	△	Do.		
Cape Chelagskoi (or Erri)	70 06 00	171 04	△	Do.		
West side of Cape Chelagskoi, 9th March	70 03 23	171 03	☽—⊙	Wrangell and Kosmin.	..	18 03
Ten wersts east of Cape Chelagskoi, 13th April	70 04 09	171 27	△	Matiuschkin.		
Black steep rocks near the last station, 6th March	70 03 17	171 39	△	Kosmin.		

Place.	Lat. N.	Long. E. from Greenwich.	Method.	Observer.	Magnetic Inclination North.	Magnetic Declination East.
	° ′ ″	° ′			° ′	° ′
Point of 30th April	70 02 39	171 46	△	Kosmin.		
Cape Kosmin, 6th March and 11th March, 1823	70 00 55	171 58	△	Do.		
Rocks on the east side of Cape Kosmin	69 56 38	172 40	R	Do.		
Point of 16th April, near the mouth of the Werkon	69 50 41	173 50		Matiuschkin.		
At the mouth of the Werkon, 30th March	69 51 00	173 30		Wrangell.	79 59	18 58
Point of 2nd April	69 52 47	173 54		Do.		
Cape Kekurnoi, 3rd April	69 50 53	174 34		Matiuschkin.		
Point of 17th April	69 49 41	174 30		Do.		
Point of 27th April, near Cape Jakan, on the return	69 41 32	176 32	△	Kosmin.		
Point of 5th and 7th April	69 48 12	176 10	☽—☉	Wrangell.	..	21 40
Point of 8th April	69 35 50	176 58	R	Kosmin.		
Cape North, 10th April	68 55 16	179 59		Do.		
Near the Amguem River, 14th April, noon	68 09 51	182 06		Do.		
Night halt on Cape Wankarem, 14th April	67 50 16	183 16		Do.		
Near Cape Onman, 15th April, noon	67 43 04	183 38		Do.		
South point of Koliutchin Island, 15th, 16th, 17th April	67 26 46	184 28		Wrangell.	..	23 26
At the mouth of the Fillippowka, 2nd July	68 41 50	161 35	△	Kosmin.		
Point of 3rd July	68 52 52	161 53	△	Do.		

Place.	Lat. N.	Long. E. from Greenwich.	Method.	Observer.	Magnetic Inclination North.	Magnetic Declination East.
	° ′ ″	° ′			° ′	° ′
Point of 4th July	69 05 22	161 53	△	Kosmin.		
Middle arm of the Sucharnowka, 5th July	69 17 55	161 47	△	Do.		
On the Island of Aiun, or Sabadei, 2nd May	65 50 53	168 29	△	Do.		
On the Tundra, Point of 1st August	69 22 57	166 14	△	Wrangell.	..	14 59
——— 2nd August	69 09 05	166 32	△	Do.		
——— 3rd August	68 57 08	166 29	△	Do.		
——— 4th August	68 46 47	166 14	△	Do.		
A hill, on 4th August	68 46 47	166 57	△	Do.		
Point of 5th August	68 36 31	165 16	△	Do.		
Point of 14th August	68 23 55	163 52	△	Do.		
Lake Wyteknoe, near Tchaun Strait, 6th August	69 39 40	168 52	△	Matiuschkin.		
Eastern outlet of the Great Baranika, 21st August	67 53 26	168 39	△	Do.		
On the Greater Aniui.						
Mouth of two streams	68 20 03	160 08	△	Do.		
Lobasnoie	68 03 35	160 24	R	Do.		
Tigilika	67 33 16	162 21	△	Do.		
Brustänka	67 36 58	162 09	△	Do.		
Baiekowo	68 18 24	160 30	△	Do.		

Places.	Lat. N.	Long. E. from Greenwich.	Method.	Observer.	Magnetic Inclination North.	Magnetic Declination.
	° ′ ″	° ′			° ′	° ′
On the Lesser Aniui.						
Outlet of the Lower Schachutina, 26th August	67 23 59	167 50	△	Matiuschkin		
Outlet of the Jelombala	67 50 09	165 12	△	Do.		
Molotkowo	68 07 40	161 40	△	Do.		
Mochowoie	68 00 41			Do.		
Maloje Wetrennoie	67 58 36	162 01	△	Do.		
Plotbischtsche	68 00 03	162 36	△	Do.		
Argunowo	68 07 06	163 00	△	Do.		
Nungol Rock	68 10 02	163 10	△	Do.		
Obrom Rock	68 01 00	164 03	△	Do.		
Konawolowo	68 05 32	163 49	△	Do.		
On the Ice of the Sea, April 1821	71 36 41	163 23	..	..	80 16	
———	70 41 0	165 22	..	..	..	14 51 E.
———April 1822	70 52 41	170 00	..	..	81 09	18 49 E.
Iakutsk, August 1820	62 01 42	129 43	..	..	73 51	5 05 W.
Irkutsk, June 1820	52 16 57	104 33	..	..	67 11	2 30 E.

☽—⊙ by Lunar Distances; △ by Triangulation; R by Reckoning.

In determining the Magnetic Inclination the poles of the needle were always changed.

On comparing the geographical positions in this table, with the latitudes and longitudes of the same places as given in the course of the narrative, occasional discrepancies will be seen, amounting to a few minutes, especially in the longitudes. This may have arisen in some instances, no doubt, from the determinations of one year being corrected by those of a second. In other instances, probably, they are attributable to a reconsideration of the data on which the first calculations were made. The values in the narrative fully serve the purpose of enabling the reader to follow its course on the map; those who desire exactness in the geographical positions, will probably do well to take in preference the values given in the table.

GEOGRAPHICAL POSITIONS, and MAGNETIC DECLINATIONS, determined by the Expedition under M. von Anjou.

Place.	Lat. N.			Longitude E. from Greenwich.			Magnetic Declination East.	
	°	′	″	°	′	″	°	′
Oust Iansk	70	55		136	86.		3	00
Village of Murasch	71	82		136	44	16	5	20
Great Camp	71	11						
Mouth of the Tchendon River	71	5	55					
Camp of Manyka	71	31	51					
Kundobeidach Arm	71	14	46					
In the Bay of Esellach	71	24						
Mouth of the Esellach River	71	26	15					
Another point in the Bay of Esellach	71	42	51					
Camp of Wankin	71	59	00	139	39			
Camp of Khar	72	10	16	140	45			
Near Cape Tchourkin	72	26	16					
Near a Lake in the Tundra	72	17	12	140	51			
Mouth of the Uriunchasstach River	72	30	37		..		8	7
Near the Svätoi Nos	72	51	34					
Mouth of the Chirokoi River	72	37	14					
Mouth of the Esangarach River	72	15	38					
Mouth of the Chroma River	71	38	20		..		8	42
Mouth of the Lantscha River	71	38	00	145	35			
Mouth of the Bogdaschkinoi River	72	12	39					

Place.	Lat. N.			Longitude E. from Greenwich.			Magnetic Declination East.	
	°	′	″	°	′	″	°	′
Mouth of the Mochotojewoi River	72	06	20		..		11	3
On the Voltschei River	71	42	7					
On the northern side of Chromskaia Bay	72	8	85					
In the Western Mouth of the Iana	71	22	58					
Cape Posledni East of Cape Bor Chaja	71	44	56					
Cape Balyktach	71	42	01		..		5	45
Three miles S.S.E. of the mouth of the Greater Amoloi River	71	12	21		..		5	15
Mouth of the Romanowoi River	70	48	23		..		4	45
Camp at the South Angle of Bor Chaja Bay	70	42	8	131	44	27	4	44
Three and a-half miles S.W. of Cape Stolbowoi	70	55	24		..		5	00
On the Island of Lach	72	8	48	130	07		6	30
Wintering Village of Lach	72	31	18	129	26	40	7	15
On the Western side of Bykovskaia Bay	71	53	00	129	20	00	5	30
On the Kogasstich Arm of the Lena at the Village of Tchalbogo	72	50	22	128	18	56	8	10
On the Iumatskaia Arm of the Lena at Village of Esagastyr	73	21	54	127	09		9	25
On the Sanadnaia Arm of the Lena at the Villiage of Turoch	72	58	00					
The Camp at Cape Krestovoi	72	56	00		..		8.	00
At the mouth of the Olenka	72	57	00					
Village of Kumaksurka on the Western Bank of the Lena	71	29	00		..		6	00
Bulun Village	70	44	37		..		4	30
On the Western Coast of the Island of Stolbovoi	73	56	00					
On the Eastern Coast of the Island of Stolbovoi	74	02	00	136	46		12	00
Kotelnoi Island Wintering Station	74	50	23	138	53			

Place.	Lat. N.	Longitude E. from Greenwich.	Magnetic Declination East.
	° ′ ″	° ′ ″	° ′
Kotelnoi Island on the N.W. Coast	76 02 00	..	14 53
„ On the E. Coast	75 46 37		
„ Near a hunter's hut on the W. Coast	75 37 50		
„ Mouth of the small River of Tchukotskoi	75 13 50		
„ South point of the Island near Cape Medveji	74 37 38		
Fadejevskoi Island Great Winter Camp	75 47 47	142 59	
„ On the S.W. Coast	75 20 07		
„ On the S. Coast	75 03 48		
„ On the E. Coast, near Cape Pesszovoi	75 15 41		
New Siberia near Cape Wissokoi	75 28 26		
„ Near Cape Plosskoi	75 22 52		
„ Near Cape Räboi	75 12 29		
„ Near the small River Mutnaia	75 04 24	150 35	15 15
„ Near a Stream	74 48 40		
„ In a Winter Hut	74 54 35		
Figurin Island	76 13 00		
Liakhow Island near the Kowrichka Rock	73 53 27		
„ Near Cape Kissiliak	73 20 00		
Vassiliev Island. Southern point	74 02 30		
Semenov Island. Northern point	74 14 30	134 16	
Belkova Island. Northern point	75 51 45		
„ Southern point	75 21 48		

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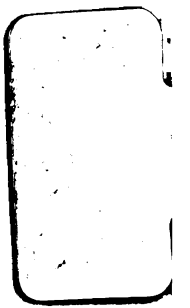
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